BLISTER RUST WORK

IN THE FAR WEST

February 1 to December 31, 1923

Spokane Branch
Office of Blister Rust Control,
624 Realty Building
Spokane, Washington

CONTENTS

Page

Introduction
- Situation at end of 1922 field season..... 1
- Third Western White Pine Blister Rust Conference..... 1
- Federal Appropriations..... 2

Project 1.
- Control Demonstration Area, Cheekye, B. C..... 4
- Brackendale Area..... 13

Project 2.
- Idaho
  - Plan of work and cooperative agreement..... 30
  - Cultivated black currant eradication..... 34
  - Educational work..... 38
  - Scouting for the disease..... 55
- Montana
  - Plan of work and cooperative agreement..... 55
  - Cultivated black currant eradication..... 57
  - Educational work..... 59
  - Scouting for the disease..... 60
- Oregon
  - Plan of work and cooperative agreement..... 79
  - Cultivated black currant eradication..... 81
  - Scouting for the disease..... 82
  - Nursery inspection..... 83
  - Educational work..... 83
- Washington
  - Plan of work.....116
  - Cultivated black currant eradication.....116
  - Nursery inspection.....116
  - Scouting for the disease.....120
- British Columbia.....121
  - Scouting for the disease by U. S. scouts.....121
- California.....121
  - General educational work.....134

Project 3.
- Local Control
  - Priest River Experiment Station project.....141
  - Recheck of 1922 experimental local control.....149
  - Control reconnaissance.....298

Project 4.....326

Financial Report

No copies available

Legend_
1921
1922
1923

INTRODUCTION

Western Blister Rust Situation at the End of the 1922 Field Season

At the end of the 1922 field season, the blister rust situation in the West was briefly as follows: extensive scouting during 1922 indicated that the disease had spread to cover an area from the mouth of the Columbia River on the southwest northward to the northern limit of western white pine on the coast of British Columbia, and eastward to the vicinity of Revelstoke, British Columbia. This area of infection roughly consisted of a triangle, each leg of which was approximately 250 to 300 miles long. From the standpoint of protection of the white pine timber in western United States two directions of spread were of particular importance; the southern spread through the coast region of Washington toward the sugar pine stands of southern Oregon and of California, and the eastern spread toward the western white pine forests of the Inland Empire.

Third Western White Pine Blister Rust Conference Recommendations for Federal Work

The Third Western White Pine Blister Rust Conference met at Portland, Oregon, on November 22-23, 1922. After considering the work of the 1922 season, and the significance of the general situation, a general program was laid down in which certain definite working principles were recognized as necessary for the ultimate control of the disease in the West. The first of these principles was that it was necessary to delay the spread of the disease into the white pine stands of western United States. This could be accomplished by the eradication of the cultivated black currant (Ribes nigrum), the most active agent in the long distance spread of the disease, and by the enforcement of the several State and Federal blister rust quarantines, to prevent the artificial spread of the disease. The second principle was that the disease must be locally controlled in the white pine stands. The time gained by the delay of the spread of the disease should be devoted to development and application of local control methods suitable to western forest conditions. Thirdly, it was recognized as necessary to carry on scientific investigations into the life history and habits of the disease under western conditions, its rate of progress and damage, susceptibility of native western host plants, and discovery of natural factors of value in retarding the spread and increasing the effectiveness of local control.

The Conference also transmitted a letter to Dr. W. A. Taylor, Chief, Bureau of Plant Industry, containing the following recommended Federal appropriation for western blister rust control work for the fiscal year 1924. This appropriation was considered the minimum amount possible under which to carry out the Federal part of the program.

Recommended Minimum Appropriation for Western Blister Rust Control

April 1, 1923 to June 30, 1924.

(1) Investigative work - distribution of disease, climatic factors, relative susceptibility of Ribes, damage to Western White Pine, overwintering, distance and rate of spread, natural barriers. Federal Appropriation..... $22,500.00

(2) Quarantine Inspection, Pacific Coast States, to be matched. Federal Appropriation..... 12,500.00

(3) Quarantine Inspection, Mississippi Valley. Federal Appropriation..... 12,500.00

(4) Survey for distribution of Ribes, scouting to determine further spread, etc. Federal Appropriation..... 25,000.00

(5) Experimental Ribes eradication by regions - Eastern Washington, Idaho, Montana, Oregon, California, Federal Appropriation..... 43,750.00

(6) Educational Work - Federal Appropriation..... 8,750.00

(7) Eradication of Black Currants in Washington, Oregon, Idaho, Montana and California - to be matched. Federal Appropriation..... 30,000.00

$155,000.00

On April 1, 1923, a Federal Appropriation of $30,000.00 became available for western blister rust work, to cover the period April 1 to June 30, 1923. In addition to this appropriation $12,000.00 was released from the eastern Federal blister rust appropriation, for western work during this same period. On July 1, 1923, a Federal Appropriation of $50,000.00 was available to cover the western work during the fiscal year July 1, 1923 to June 30, 1924. Thus, a total of $92,000.00 was available for this total 15-month period.

These funds were allotted by the Department of Agriculture into the following projects:

Project.	Appropriation for Period Apr. 1 to June 30, 1923.	Period July 1, 1923 to June 30, 1924.	Total.
1. Scientific investigation of the disease by Office of Forest Pathology and establishment of a control demonstration area at Cheekye, British Columbia.	$13,700.00	$7,100.00	$20,800.00
2. Location and eradication of cultivated black currants, nursery inspection, scouting for the disease, and educational work.	11,700.00	17,400.00	29,100.00
3. Control reconnaissance and experimental local control, in the White Pine forests of northeastern Washington, northern Idaho, and northwestern Montana.	4,700.00	7,600.00	12,300.00
4. Inspection of nursery shipments for violations of blister rust quarantines in cooperation with Federal Horticultural Board	7,095.00	7,800.00	14,895.00
5. For general supervision of field work, and miscellaneous expenses of western field office.	3,395.00	8,600.00	11,995.00
Total	$40,590.00	$48,500.00	$89,090.00

The balance of the $92,000.00 consists of the departmental reserve and necessary expenditures in the Washington Blister Rust Office.

The following report covers the activities of the western field office of the Office of Blister Rust Control, Bureau of Plant Industry, for the Period April 1, to December 31, 1923, in carrying out the program as outlined.

PROJECT 1.

SCIENTIFIC INVESTIGATION OF THE DISEASE, AND ESTABLISHMENT OF A CONTROL DEMONSTRATION AREA.

Work on the scientific investigation of blister rust under western conditions was assigned to the Office of Forest Pathology, Bureau of Plant Industry, under the direction of Dr. J. S. Boyce. The progress of this work is included in Dr. Boyce's report.

Establishment of Control Demonstration Area at Cheekye, British Columbia

The most important single factor in the local control of blister rust is the distance which the disease can travel from Ribes to white pine and cause infection on the pine. In the eastern United States the average distance at which white pine is considered safe from infected Ribes is approximately 300 yards except in the case of Ribes nigrum. In order to determine the minimum safety factor of distance from native Ribes to native western white pine under field conditions in the West a control demonstration area was established by the Office of Blister Rust Control in cooperation with the Office of Forest Pathology and with the Canadian authorities. This plot was located at Cheekye, B. C., approximately forty miles north of Vancouver, on the Pacific Great Eastern Railroad. The working plan followed consisted in (1) thorough eradication of all Ribes from the area (2) planting healthy western white pine transplants in the area, and (3) examination of these planted white pine in future years to determine how far infection had spread to them from diseased Ribes surrounding the plot. The conditions determining the location of the plot were:

1. Abundance of native Ribes and of native western white pine.
2. Abundance of blister rust on both Ribes and white pine.
3. Suitable planting conditions.

The area chosen satisfied all these conditions.

Through the courtesy of the Forestry Branch of the Department of Lands, a plot of 160 acres at Cheekye was reserved from the public lands of the Province of British Columbia for a period of ten years, beginning May 1923, in order to complete this experiment. This plot is located in Lot 3186 G. I. New Westminister District, and comprises Blocks 23 to 30, 31 to 34, and 43 to 46 inclusive.

The plot is situated about nine miles north of the head of Howe Sound up the Cheakamus River Valley, 1 mile east of the junction of the Cheakamus and Squamish Rivers, at an elevation of 200 to 300 feet. The mountains on either side of the valley rise abruptly to 4000 feet. The accompanying maps, No. 1 and No. 2, show the location and topography of the area.

The land is part of a southwesterly sloping alluvial fan, with portions of the underlying bed rock standing as isolated knobs or mounds from 15 to 45 feet above the general level. The soil material is imperfectly assorted, varying from soils of silty texture to occasional large boulders.

Small draws, probably former stream channels, cross the area from northeast to southwest.

The conditions on the plot, prior to the Ribes eradication and pine planting were as follows: the area had been logged off and burned over. An old dismantled logging railroad crossed the plot. Stumps and down logs were numerous. On the southwest portion of the plot a heavy windfall of large

RIBES ERADICATION DATA

Locality 40 1/4 Sec. T R Sheet No.

No. Men
Foreman
Checker

Ribes type
Timber type
Date

Recorded by
Measured by
Strip No.

Species	RIBES								CREW TIME MAN MINUTES				WHITE PINES				STRIP TIME		REMARKS
	Ht	Ft. of L.S.	Screen H	Screen M	Screen L	Screen O	Infection Uredinial	Infection Telial	Pulling bushes	Checking back	Lost time	Rest	Ht.	Fruiting	Not Fruiting	None	Began	Ended	Weather.
																			Other conditions affecting

Checks on bushes

Species	Man No.	Ht.	Screen	Reason

trees made pine planting and Ribes eradication more difficult. A young growth of western white pine, Douglas fir, lodgepole pine, willow, Oregon maple, poplar, etc., approximately fifteen years old, was growing up. Native Ribes, principally R. sanguineum and R. lacustre were numerous, with a few small bushes of Grossularia divaricata and R. bracteosum.

Blister rust was abundant and practically coincident with the distribution of western white pines. Over one fourth of the pines on the plot were infected. Infection conditions on the plot are shown by Table No. 1. The feet of live stem of Ribes per quadrant is also given, to show any possible relation to the amount of pine infection.

Table 1.

Pine Infection on Plot

Quadrant	Ribes		White Pines						
	No.	Ft. L. S.	Infected	Healthy	Total	Av. Ht. of Pines (Feet)	% Infected	% Infected Pines Dead	Cankers per Infected Trees
N.W.	803	7,324.4	958	1,573	2,531	3.31	37.85	8.04	2.22
N.E.	1,484	17,294.2	178	161	339	2.08	52.51	28.75	1.15
S.E.	1,857	13,045.0	154	318	472	2.01	32.63	24.68	1.54
S.W.	640	10,349.1	93	1,813	1,906	1.22	4.88	7.53	1.14
Total	4,784	48,012.7	1,383	3,865	5,248	2.30	26.35	12.51	1.85

An examination of the native infected pines on the plot showed that infection had occurred on 1915 to 1922 growth. The following table, giving the number and percentage of pines infected by year of wood infected, shows that the 1918, 1919, and 1920, wood is the most heavily infected, 91.4% of the infections occuring on those years growth.

Table 2.

Age of Infected Wood of White Pines

Development of Cankers	Number or Percent Cankers	YEAR								Total Known	Not Known	Total
		1915	1916	1917	1918	1919	1920	1921	1922			
Fruiting	Number	2	32	59	223	324	112	3		755	223	978
	Percent	0.3	4.2	7.8	29.5	42.9	14.9	0.4		34		
Incipient	Number		1.	3	64	610	693	86	4	1461	121	1582
	Percent		0.1	0.2	4.4	41.7	47.4	5.9	0.3	66		
Total	Number	2	33	62	287	934	805	89	4	2216	344	2560
	Percent	0.1	1.5	2.8	13.0	42.1	36.3	4.0	0.2			

The nearest source of infection to which the planted pine is subject is shown by the following table. The data were taken from a circular strip one chain wide immediately surrounding the plot:

Table 3.

Infection Conditions Surrounding Plot.

Radius Affected	45° Arc of Circle	RIBES								WHITE PINES							
		R. sanguineum		R. lacustre		G. divaricata		Total		Infected	Healthy	Total	Av. Ht. Feet	% Infected	% of Infected Pines Dead	Total No. of Cankers	Cankers per Infected Tree
		No.	Ft. L.S.	No.	Ft. L.S.	No.	Ft. L.S.	No.	Ft. L.S.								
N.	N.22°W to N.23°E	24	567	16	279			40	846	22	23	45	2.02	48.89	18.18	38	1.73
N. E.	N.23°E to N.68°E	75	1533	24	221	1	5	100	1759	3	3	6	1.75	50.	0.	6	2.00
E.	N.68°E to S.67°E	404	1905	17	425			421	2330	4	17	21	1.90	19.05	0.	43	10.75
S. E.	S.67°E to S.22°E	5	96	3	42			8	138	13	31	44	2.52	29.55	15.38	27	2.08
S.	S.22°E to S.23°W	5	141	4	17	1	60	10	218	7	29	36	2.14	19.44	42.86	9	1.29
S. W.	S.23°W to S.68°W	1	6			1	10	2	16	5	234	239	.96	2.09	20.00	5	1.00
W.	S.68°W to N.67°W	1	150	18	302	1	3	20	455	273	462	735	3.60	37.14	9.52	990	3.62
N. W.	N.67°W to N.22°W	8	242					8	242	81	128	209	2.63	43.54	18.52	161	1.99
	Total	523	4640	82	1286	4	78	609	6004	408	927	1335	2.81	30.56	12.50	1279	3.13

During the early season of 1923, the Ribes in the vicinity of the plot were found infected as follows:

Table 4

Earliest Dates of Ribes Infection Found

Species	Date 1st Found	Stage	Place	Found By
G. divaricata	5/7/23	Uredinial	Brackendale P. O.	L.H.Pennington H.N.Putnam
R. sanguineum	5/12/23	Uredinial	Cheekye Plot	H.N.Putnam
R. lacustre	5/12/23	Uredinial	Cheekye Plot	H.N.Putnam
R. bracteosum	5/15/23	Uredinial	Along Cheakamus River near Cheekye	W.A.Rockie H.N.Putnam
R. laxiflorum	5/30/23	Uredinial	Upper Squamish (3 Miles above Cheekye)	W.A.Rockie H.N.Putnam
G. divaricata	6/1/23	Telial	West of Cheekye Plot ½ Mile	L.N.Goodding

A careful search was made on all Ribes as they were pulled for telial infection. None was found except in one case. On June 14 a G. divaricata bush was found on the third time over the area 150 feet northwest of the 11th chain stake on the southwest planted radius. It was 3 feet high, and had 5 feet of live stem. Of the 103 leaves on the bush, 10 showed uredinia and 3 telial infections. The telia were just beginning to form. No sign of sporulation was evident thru a hand lens. The leaves showing telia were 15 inches above ground. The bush was pulled, and all the infected leaves carefully picked.

Surveying Area

A circular area having a radius of 1250 feet or 18.94 chains, making 112.69 acres was laid out in the following manner: After the proper center for this area was established, 8 radii, running N., N.E., E., S.E., S., S.W., W., and N.W., were surveyed. The circumference was then surveyed by the method of deflection angles, as follows: a station was established on the circumference at every 2° of central angle, making a total of 180 stations. The compass was set up at Station 0, on the outer end of the north radius. The compass man then set the compass to read S.89° E., or 1 degree less than a right angle. Station 1 was established 43.6 feet from Station 0 on the above bearing. ($43.6 \text{ feet} = \frac{\text{Circumference}}{180 \text{ Stations}} = \frac{3.1416 \times 2500}{180}$. In a similar way station 2 was established 43.6 feet from station 1 on a bearing of S.88° E., and so on around the circle. As many shots as could be

see were taken from one set up. The work was checked at the end of every radius, and any error distributed.

The area was more permanently marked by means of seasoned Douglas fir stakes, 3 feet long by 2 inches square. These were sharpened at one end and this end dipped for a foot of their length in creosote. The other end was painted white with the proper inscription painted in black on the white surface. These stakes were then placed as follows:

1. On each of the eight radii at every chain, giving bearing and distance in chains from the center.
2. On the circumference every 43.6 feet, giving the bearing every two degrees of central angle.
3. After the pines were planted a stake was set at every fourth pine numbered consecutively from the outside towards the center, on the center row of planted pines along each radius.

In addition a large 8-sided post was set in the center of the plot giving the bearing of each of the eight radii, and a 12 gauge telephone wire extended for two chains from the center along each radius. Also at the outer edge of each radius a similarly sized post was set and marked, and telephone wire strung along the radius towards the center for a distance of two chains. Telephone wire was strung around the entire circumference of the plot.

Eradication of Native Ribes

The eradication crew consisted of 5 men on line and a foreman back of the line. The spacing between linemen was approximately 6 feet. One of the end men was the paper trail maker, dropping paper as he went along to mark the outer edge of the crew strip. At the end of the strip the crew would swing around so that the paper dropper could follow his own trail back and the other end man drop paper. Owing to the distraction of dropping or following a paper trail, each end man was responsible for only a 3 foot width of strip, so the crew covered a strip approximately 24 feet in width. The men pulled the bushes by hand instead of using any tools. In addition to the crew proper, there were also a checker, whose duty it was to assist the foreman in checking back of the crew, and two recorders, who took and recorded such data as species of Ribes, their height and live stem; disease conditions on Ribes and pines; time of pulling, checking back, etc., according to the accompanying sample data sheet. During the later stages of the work it was found necessary to use only one recorder, because one recorder was found sufficient.

Two crews were kept in the field, working the area by separate quadrants. The plot was gone over three times. In rechecking the area for Ribes, each crew covered the other's ground, and at right angles to the direction taken the first time, thus stimulating rivalry between the two crews, and also making it possible to observe missed bushes from a new angle.

The following table gives the results of the three eradications:

Table 5

Ribes Eradication

Time Over	Inclusive Dates	No. Crew Days	Ribes Pulled										Av. Ft. L. S. per Bush	Per Acre	
			R. sanguineum		R. lacustre		G. divaricata		R. bracteosum		Total				
			No.	Ft. L. S.	No.	Ft. L. S.	No.	Ft. L. S.	No.	Ft. L. S.	No.	Ft. L. S.		No. Bushes	Ft. L. S.
1 st	5/3 to 5/23	26.5	4,068	39,812.2	502	7,448.8	29	202.0			4,599	47,463.0	10.32	40.8	421.2
2 nd	5/24 to 6/7	22.5	110	410.7	19	52.0	5	36.0	2	2.5	136	501.2	3.88	1.2	4.4
3 rd	6/12 to 6/15	6.	9	17.5	34	17.0	1	5.0	9	9.0	53	48.5	.91	.5	.4
Total	5/3 to 6/19	55.0	4,187	40,240.4	555	7,517.8	35	243.0	11	11.5	4,788	48,012.7	10.03	42.5	426.1

Percent of efficiency 1st time over by bushes = 93.96 +
Percent of efficiency 1st time over by feet live stem = 98.86-

It may be noted that the average live stem of the bushes found the first time over is approximately 3 times that of the second; and 11 times that of the 3rd.

The following table analyzes the time employed in the field in the first eradication:

Table 6

Eradication Time Analysis
(in Man Hours)

Quadrant	Searching Time	Pulling Time	Checking Back	Lost Time	Rest Time	Total Time
N. W.	245.5	10.9	37.3	12.4	15.8	321.9
N. E.	141.9	21.5	13.4	8.0	14.0	198.8
S. E.	132.2	25.2	8.3	7.9	9.3	182.9
S. W.	176.6	9.9	9.5	11.8	20.3	228.1
Totals	696.2	67.5	68.5	40.1	59.4	931.7
% of Total Time	74.7	7.2	7.4	4.3	6.4	100.

The average time necessary to pull a Ribes bush on the plot was 45 seconds.

White Pine Planting

Healthy western white pine two year transplants from the Wind River Forest Experiment Station, Carson, Washington, were used. On April 27, 1923, 5000 were shipped by express to Cheekye, B. C. They were received on May 7, in good condition except that during the 10 days of travelling they had been in a horizontal position, resulting in the new growth assuming a position at right angles to the stem. The pines were heeled in immediately on receipt and well watered.

On each of the 8 radii 3 rows of pines were planted 6 feet apart with the trees spaced 6 feet in each row. This work was completely done on May 10, by starting at 4 A.M. and working until dark. The weather was ideal for planting, being cloudy and rainy throughout the day.

The pines were carried to the planting sites in pails with the roots immersed in a mixture of clay and water. Care was taken to expose the roots to the air as little as possible.

The men worked in planting crews of two men to a row. One man with a straight edged spade made an opening in the mineral soil, while his partner placed the pine in it, taking care that the roots were not doubled up, and packed the earth tightly with his feet. Proper spacing was provided by means of a rope or wire with knots every 6 feet stretched along the center row of the radius.

In order to distinguish the planted pines from nearby native pines pins 8 inches long made of telephone wire looped at one end and marked with white cheese cloth were placed at each planted pine. When the pines are larger it is the intention to wire small metal tags on each tree giving the row and number of the pine.

Nearly 90% of the pines planted in May were alive in September, as is seen from the following table:

Table 7

Results of Pine Planting

Radius	Total Pines Planted May 10	June 1923				September 1923		
		Dead	Dormant	Missing	% Alive	Dead	Missing	Alive %
North	624		2	4	99.04	21	3	96.15
N. E.	621	5		20	95.96	51	12	89.86
East	622	5		1	99.03	19	5	96.14
S. E.	634	10	9	12	95.11	36	26	90.22
South	564	2	2	3	98.76	16	6	96.13
S. W.	538	6	9	14	94.60	75	34	79.74
West	562	5		7	97.87	78	22	82.21
N. W.	598	15	5	18	93.65	62	17	86.79
Total	4.763	48	27	79	96.76	358	125	89.86

Guarding the Area From Fire

One of the members of the crew was appointed as fire guard for the area from July 1 to September 30. He worked under the direction of the District Ranger. No fires were reported in that vicinity during the fire season.

Suggestions for Future Work

1. Examine planted pines carefully for signs of infection and tag each individual infection.

2. Replace with healthy western white pine transplants any trees which have died.

3. Check over area thoroughly for Ribes. If any are found locate them carefully on a map, and destroy them.

4. Patrol area for fire during fire season.

Investigations of Blister Rust Conditions on Brackendale Area

In the course of the work on the Cheekye Plot, a nearby area south of this plot was observed on which there was abundant infection on native P. monticola, but on which Ribes were evidently very scarce. To supplement the information to be obtained on the Cheekye Plot, special studies were made on this area, known as the Brackendale area.

The location of the Brackendale Area can be seen from Map No. 3 (in report on Cheekye Plot).

Three different studies were made on this Brackendale area as indicated on Map No. 4. The studies and the areas on which the studies were carried on are given the same numbers.

Study No. 1.

Study No. 1, consisting of 43.05 acres, has its center 32 chains south of the southern limit of the Cheekye Plot. It occupies Blocks 63-64-77 and 78 in the southeast corner of Lot 3186GI. New Westminister District, British Columbia.

The area on which Plot No. 1 lies has been logged off. The northwest third of the plot was burned over in 1916 or 1917. This burned area now bears a spotted growth of Vaccinium, Acer, and Salix 3 to 6 feet high, with a more general but young and very low growth of Gaultheria shallon. In addition to this deciduous growth there are numerous young P. monticola, 1/2 to 2 feet high, associated with young Pseudotsuga taxifolia, Tsuga heterophylla and occasional P. contorta.

BRACKENDALE, B. C. EXPERIMENTAL PLOT

Strip No.	Transect No.	WHITE PINE							RIBES						Ground Cover	Date	Remark
		Height of Tree	Infection					Average Height of Vegetation	Species	Height	Feet Live Stem	Degree Concealment H.M.L.O.	Infection				
			None	Fruiting		Incipient							Uredo	Telial			
				Above	Below	Above	Below										

The remainder of the plot supports a very dense mixed coniferous growth from 20 to 35 year of age, consisting of P. monticola, Pseudotsuga taxifolia, Tsuga heterophylla and P. contorta. Occasional P. monticola, of an older age class, and from 50 to 75 feet in height, occur. The ground cover in this unburned portion consists of a very heavy growth of Gaultheria shallon from 1 to 3 feet high.

Lines running north and south 1 chain apart were surveyed out, and stakes set at every chain on each line, thus dividing the area into square chains. This was done in advance of the actual crew work. The ground was then completely gone over by consecutive rod strips, and data were taken on all Ribes and white pines, by square rod transects, according to the accompanying sample data sheet.

The data crew consisted of 9 men on line, covering a strip 1 chain in width, and 4 recorders back of the line. The center man in line was compass man and chain man. His duty was to indicate the proper bearing to be followed, and to designate rod lengths on the strip, by means of a tape 1 rod long attached to his belt. He oriented himself every chain by means of the chain stakes. The remainder of the crew acted as four separate units abreast, each two men on line, and a recorder obtaining data on a square rod transect.

The data taken on the plot are indicated on Map No. 3. From this data the following deductions appear to be justified.

1. White pines (P. monticola) occur generally over the plot, but are much more abundant on the unburned portion. On the burned area the pines are very small, varying from six inches to two feet tall, while those on the unburned area are from 20 to 35 years old with an occasional tree from 50 to 75 feet tall.

2. Three species of Ribes were found on the plot, R. sanguineum, R. lacustre, and G. divaricata. There were 112 bushes with a total live stem of 220.3 feet, or less than 2 feet of live stem per bush. These Ribes were all located in a small area on the burned portion of the block. The cause for the occurrence of this small patch of Ribes is unknown.

3. Pine infections were much more numerous on the unburned than on the burned portion of the plot.

4. Pine infection seems to be more dependent upon the size or age of the pines, than on the immediate proximity of Ribes.

5. The average percent of infection on the area is

$$\frac{2126 \text{ Infected Pines}}{9591 \text{ Total Pines}} = 22.2\%$$

On this plot some data were also taken regarding the age of the wood upon which cankers occurred. In this study 106 trees were inspected. The trees were on an average 15.5 ft. high and were of an average age of 22.6 years. The results are given in Table No. 8:

Table 8.

Age of Wood Infected

Development of Canker		Year of Wood at Center of Canker									
		1913	1914	1915	1916	1917	1918	1919	1920	1921	Total
Fruiting Stage	Number	1	9	34	88	92	36	7	7	3	277
	Percent	.4	3.2	12.3	31.8	33.2	13.0	2.5	2.5	1.1	91.1
Incipient Stage	Number			1	1	2	4	10	9		27
	Percent			3.7	3.7	7.4	14.8	37.1	33.3		8.9
Total Cankers	Number	1	9	35	89	94	40	17	16	3	304
	Percent	.3	3.0	11.5	29.3	30.9	13.2	5.6	5.2	1.0	100.0

From this table the following facts are apparent:

1. Over 91% of the total cankers were in the fruiting stage.
2. More than 60% of the total cankers studied were found on 1916 and 1917 wood.
3. There is an abrupt decrease in the number of cankers found on wood immediately preceeding and following 1916 and 1917.

Study No. 2

Besides Study No. 1, an additional area 9 chains wide on the immediate east, and 10 chains wide on the immediate south of Plot No. 1, making 48.45 acres additional was studied. (See Map No. 3.) This area was similar to the unburned portion of Plot No. 1, in that it supported a dense, mixed coniferous growth 20 to 35 years old, with a heavy ground cover of Gaultheria shallon. Only Ribes data were taken on this plot.

In making the search for Ribes, the area was covered by a crew of 9 men on line covering a strip 1 chain wide, as in the previous study, excepting that there were no recorders. The center man was compass man, chainman, and recorder. He had a chain tape attached to his belt. He advanced a chain length in the proper direction, and the remainder of the crew walked abreast looking for Ribes, until they reached him, when the process was repeated. In this way the entire area was covered for Ribes by consecutive strips.

As a result of this study only two additional patches of Ribes were found, one located near the southwest corner of Plot No. 1 and the other near the southeast corner of Plot No. 1. Map No. 3 shows the exact location of these bushes. These bushes consisted of 3 R. sanguineum, and 1 R. lacustre, with a total live stem of 25 feet, or 8 1/3 feet of live stem per bush.

The amount of pine infection is indicated by those portions of the strip lines running thru the area as a result of Plot study No. 3. Most of the pines, and pine infections occur south of Plot No. 1. Pines are relatively scarce east of Plot No. 1.

Study No. 3

In order to obtain further information regarding conditions in the Brackendale area, 27 one man strips, 1/2 rod wide, were run from the edges of Plot No. 1 at various intervals, north, northeast, east, southeast, south, southwest, west, and northwest. These strips continued until either the limit of white pine growth, or a heavy growth of Ribes was reached. Ribes and white pine infection data were taken. The location of the lines and the data taken on these lines is recorded on Map No. 4.

As a result of the data obtained from these strip lines the following facts were disclosed:

1. No heavy concentration of Ribes was found excepting in moist locations along the streams.
2. There was practically no association of white pine and large quantities of Ribes found.
3. Two cultivated black currants (R. nigrum), were found at Brackendale Post Office, 84 chains south of the center of Area No. 1.
4. Wild Ribes were found in abundance practically surrounding the Brackendale Area. They seem to be concentrated along Lake Alice Creek on the east and south; along Squamish River on the west; and along Cheekye Creek on the north.
5. No greater degree of infection was evident on pines located near the groups of Ribes, than on those farther away. Pine infection seemed to be general over the region.

Conclusions.

1. In the Brackendale area, pine infection is abundant with associated Ribes very scarce, or absent.
2. No increase of infection on pines was evident near associated Ribes.
3. Wild Ribes consisting of Ribes bracteosum, R. lacustre, G. divaricata, and R. sanguineum, were abundant along the streams on four sides of the area, varying in distance from 3/4 to 2 miles away.
4. Most of the infection was on 1916 and 1917 wood, with a much smaller number of infections on wood of other years.

For the above reasons it is thought probable that the few Ribes associated with the infected pines were not so much the cause of infection as the larger quantities of Ribes, along the streams, and within 3/4 to 2 miles from the area. It is believed that a combination of abundant telial infection, and climatic conditions favorable to the spread of the disease enabled sporidia to be carried nearly a mile or more, and to cause the general pine infection in the region.

Relation of Crown Class to White Pine Infection On Brackendale Area

The following studies of relation of crown class to infection of white pines were made on the Brackendale Plot No. 1. In recording the data for this plot, observations were taken on the development of all white pines in relation to the general vegetation on the area. The trees were segregated into 3 crown classes: dominant, intermediate and overtopped.

For purposes of this study, the following definitions were used for these three terms:

Dominant: Trees with crowns extending above the general level of the forest canopy and receiving full light from above and partly from the side; larger than the average trees in the stands, and with crowns well developed but possibly somewhat crowded on the sides.

Intermediate: Trees with crowns joining or extending into the general level of the forest canopy and receiving light from above but little or none from the sides; usually with medium to small crowns more or less crowded on the side.

Overtopped: Trees with crowns entirely below the general forest canopy, and receiving no direct light either from above or from the sides.

These terms as here used bear the following relation to the terms as used in forest terminology:(1)

Dominant	-- Dominant.
Intermediate	-- Co-dominant plus intermediate.
Overtopped	-- Overtopped, including oppressed and suppressed.

In the course of this study, 8556 white pines on 30.75 acres were classified according to crown class, and examined for blister rust infection. The results of this classification are given in Table No. 9. As given in this table, the ratio of dominant, intermediate and overtopped white pines in the stand, irrespective of height class, is approximately 5 to 3 to 2.

The data given in Table No. 9. have also been plotted in Figure 1. This figure shows that in the total white pine stand the dominants are most numerous in all height classes except the 5.1 to 10 feet class. In this class the percentage of intermediates is slightly higher than that of dominants. The percentage of overtopped trees is consistently lower throughout than that of either of the other crown classes.

(1) Forest Terminology. Journal of Forestry Vol. XV No. 1, January 1917.

Table No. 9.

Proportion of Dominant, Intermediate and Overtopped Trees in Stand.

Height Class, Feet	Dominant		Intermediate		Overtopped		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
0 - 5	2,436	48.3	1,488	29.5	1,120	22.2	5,044	100
5.1 - 10	632	37.4	682	40.4	375	22.2	1,689	100
10.1 - 15	417	52.2	269	33.7	113	14.1	799	100
15.1 - 20	247	64.8	102	26.8	32	8.4	381	100
20.1 - 25	194	78.1	48	19.5	6	2.4	248	100
25.1 - 30	153	90.0	13	7.6	4	2.4	170	100
30.1 - 35	80	87.9	11	12.1			91	100
35.1 - 40	62	100.0					62	100
40.1 - 45	15	100.0					15	100
45.1 - 50	29	100.0					29	100
50.1 - 60	18	100.0					18	100
60.1 - 70	6	100.0					6	100
70.1 - 80	4	100.0					4	100
Total	4,293	50.2	2,613	30.5	1,650	19.3	8,556	100

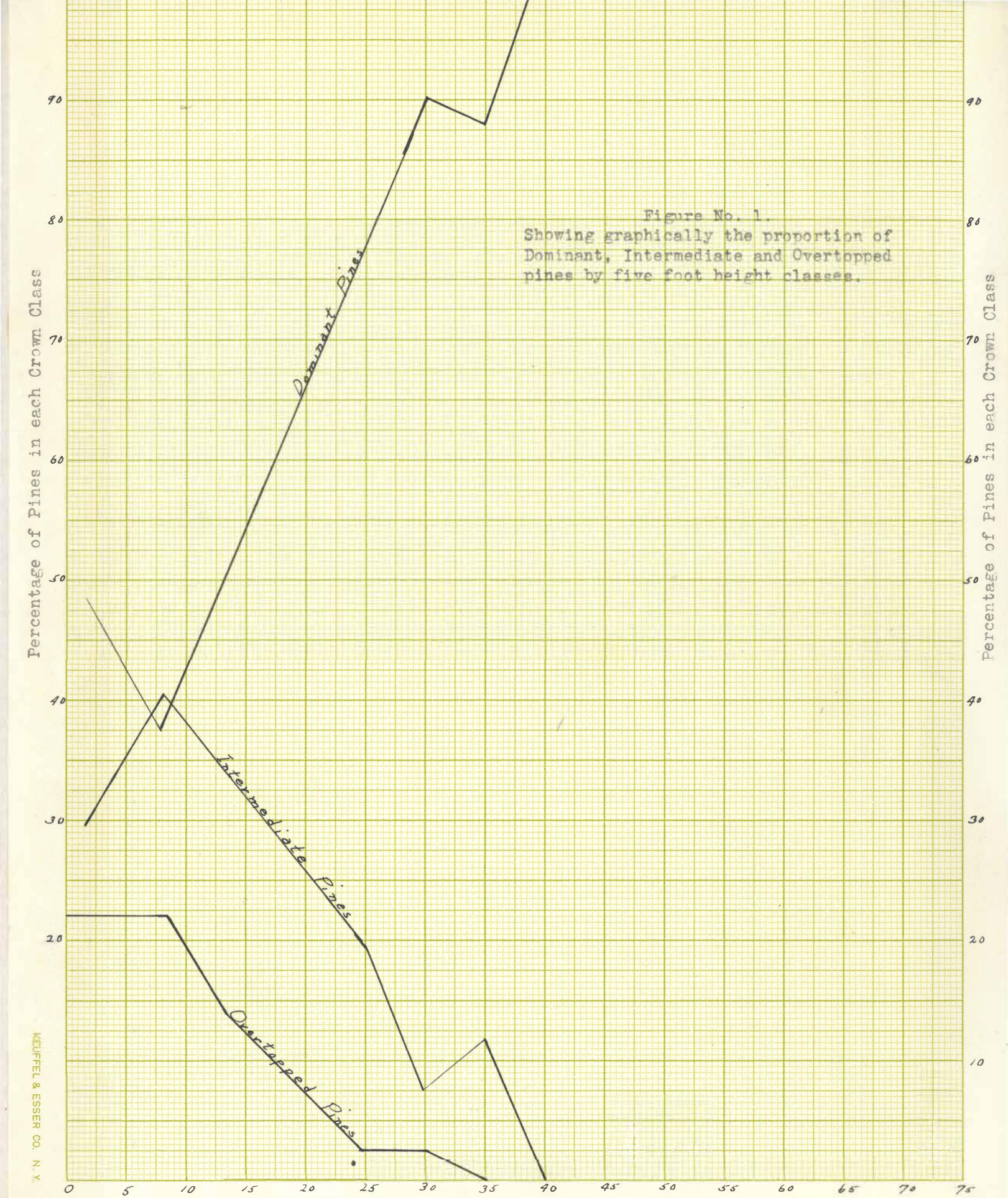

Figure No. 1.
Showing graphically the proportion of Dominant, Intermediate and Overtopped pines by five foot height classes.

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Percentage of Pines Infected.

Table No. 10 gives the number of healthy and infected trees, and the percentage of infected trees, according to crown and height classes. Tables No. 9 and No. 10 give the general results of the field observations, and constitute the basic figures from which all subsequent tables and figures are derived.

Figure No. 2, shows graphically the percentage of pines infected in each crown class, and the average for all crown classes, plotted according to the average height of the trees in each height class, as tabulated in Table No. 10. The average curve up to the 30 feet height class constitutes an average of all 3 crown classes; from 30 feet to 35 feet it is an average of only the dominant and intermediate crown classes. The average curve stops at the 35 feet height class, as only dominant trees were found over 35 feet in height.

It will be noted that the percentage of trees infected rapidly increases by height classes in each crown class. In each crown class the curve sharply declines at a height of 19 feet. However, after a slight decrease, extending to the 25 feet height class, the percentage of trees infected in the dominants continues to increase. From this 19 feet height upward, the intermediates show a slight and the overtopped a decided decrease in percentage of trees infected.

Figure No. 2 shows the percentage of infected dominant trees in any height class to be greater than the average for all crown classes. Although none of the trees on the plot were of merchantable size, the dominants undoubtedly have the most favorable chance of reaching such size and of doing so in the shortest time. Hence trees of the greatest potential timber value in the stand are more often infected than those of less potential value.

The percentage of trees infected in the intermediate crown class is slightly above the average up to a height of 17.5 feet, after which it decreases. The percentage of all trees infected in the intermediate crown class is the same as the average percentage of infection in the stand. The percentage of trees infected in the overtopped crown class is consistently below the average.

Cankers per Infected Tree.

Table No. 11 shows the number of infected trees, the total number of cankers, and the number of cankers per infected tree, in each height class. In figure No. 3, the average number of cankers per infected tree in each crown class and the average number of cankers per infected tree in all crown class have been plotted according to height classes.

It will be noted that the number of cankers per infected tree generally increases with the height class. Also, the number of cankers per infected tree is practically coincident among the very small trees, or up to a height of 2 feet. Above this height, the dominants consistently show a greater number of cankers than the intermediate or overtopped. Likewise, the number of cankers per infected tree in the dominant crown class is consistently, though not greatly, above the average.

Table No. 10
Infection Conditions According to Crown Classes and Height Classes

Height Class (Feet)	Ave. Ht. in Ht. Class	Dominant Trees				Intermediate Trees				Overtopped Trees				Total Trees			
		Healthy	Infected	Total	Percent Infected in Crown Class	Healthy	Infected	Total	Percent Infected in Crown Class	Healthy	Infected	Total	Percent Infected in Crown Class	Healthy	Infected	Total	Average Percentage of Infection
0-5	2.15	2286	150	2436	6.2	1354	134	1488	9.0	1056	64	1120	5.7	4696	348	5044	6.9
5.1-10	7.85	419	213	632	33.7	470	212	682	31.1	292	83	375	22.1	1181	508	1689	30.1
10.1-15	13.5	189	228	417	54.7	119	150	269	55.8	75	38	113	33.6	383	416	799	52.1
15.1-20	19.0	74	173	247	70.0	34	68	102	66.7	13	19	32	59.4	121	260	381	68.2
20.1-25	25.0	61	133	194	68.6	16	32	48	66.7	4	2	6	33.3	81	167	248	67.3
25.1-30	30.0	43	110	153	71.9	5	8	13	61.5	4	0	4	0	52	118	170	69.4
30.1-35	35.0	18	62	80	77.5	4	7	11	63.6					22	69	91	75.8
35.1-40	40.0	13	49	62	79.0									13	49	62	79.0
40.1-45	45.0	2	13	15	86.7									2	13	15	86.7
45.1-50	50.0	4	25	29	86.2									4	25	29	86.2
50.1-60	58.0	3	15	18	83.3									3	15	18	83.3
60.1-70	68.0	0	6	6	100.0									0	6	6	100.0
70.1-80	75.0	0	4	4	100.0									0	4	4	100.0
Total		3112	1181	4293	27.5	2002	611	2613	23.4	1444	206	1650	12.5	6558	1998	8556	23.4

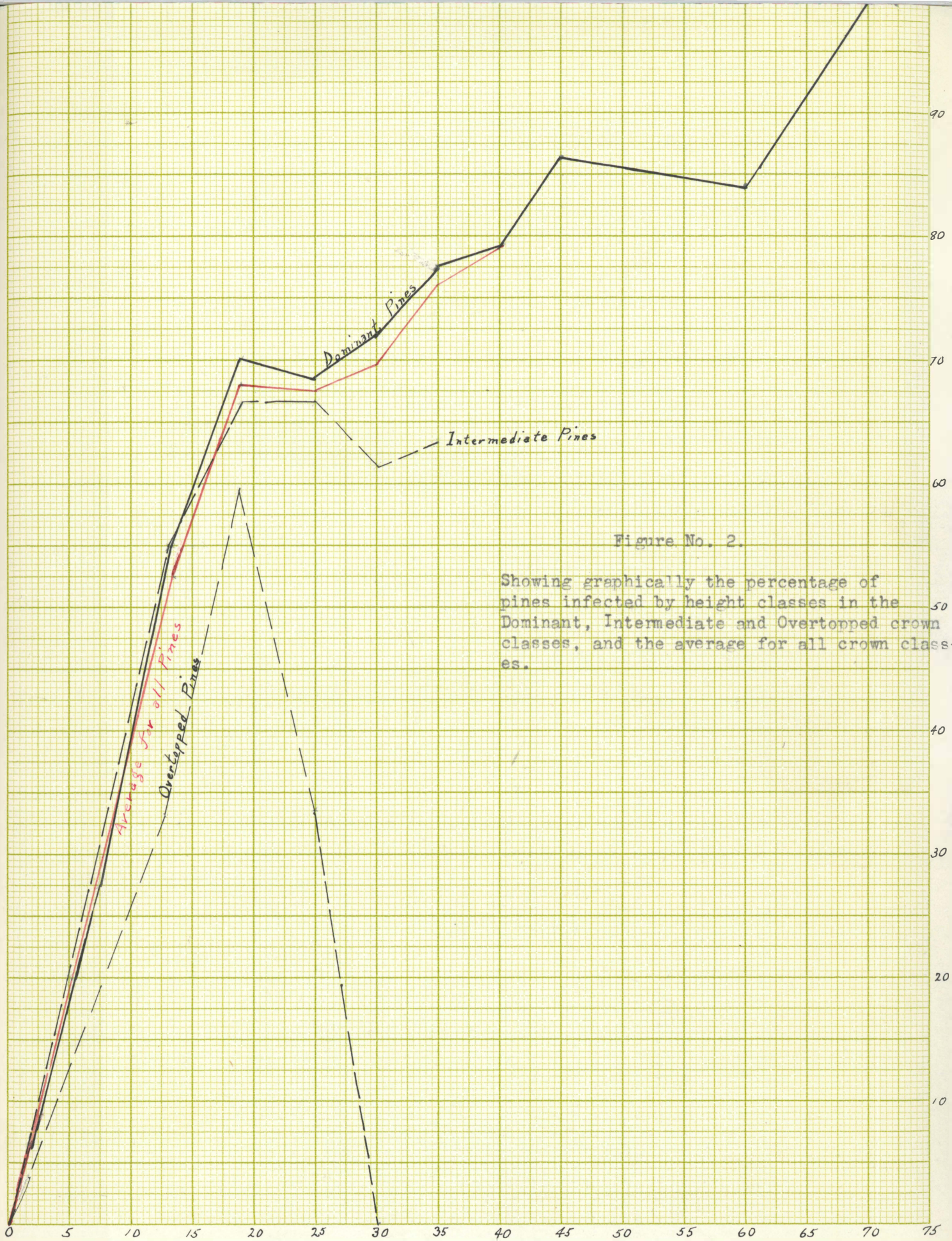

Figure No. 2.

Showing graphically the percentage of pines infected by height classes in the Dominant, Intermediate and Overtopped crown classes, and the average for all crown classes.

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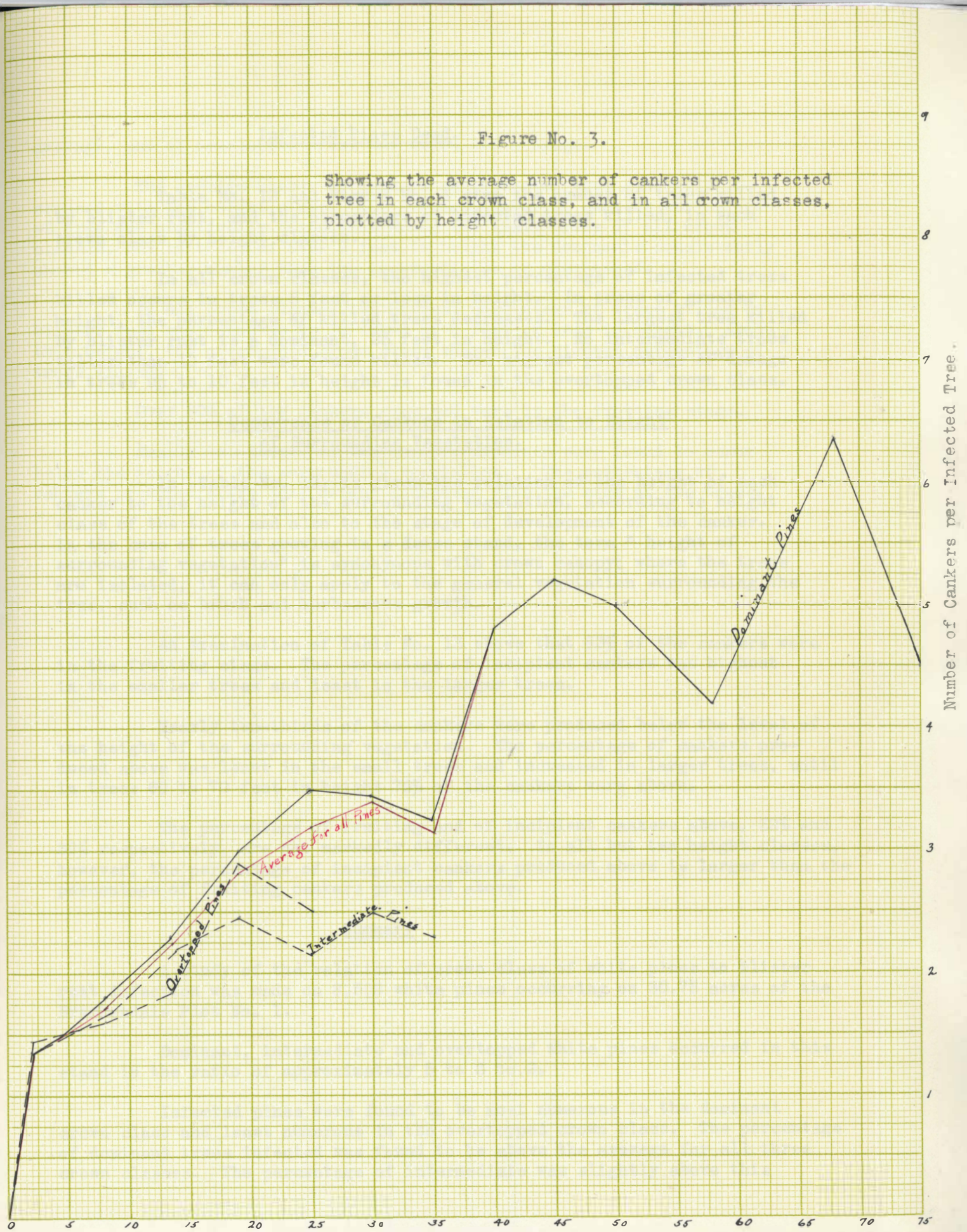
Table No. 11.
Cankers Per Infected Tree.

Height Class (Feet)	Av. Ht. in Ht. Class	Dominant			Intermediate			Overtopped			Total		
		No. of Infected Trees	Total No. of Cankers	Cankers per Infected Tree	No. of Infected Trees	Total No. of Cankers	Cankers per Infected Tree	No. of Infected Trees	Total No. of Cankers	Cankers per Infected Tree	No. of Infected Trees	Total No. of Cankers	Cankers per Infected Tree
0- 5	2.15	150	199	1.33	134	177	1.32	64	92	1.44	348	468	1.34
5.1-10	7.85	213	380	1.78	212	355	1.67	83	136	1.64	508	871	1.71
10.1-15	13.5	228	522	2.29	150	327	2.19	38	71	1.87	416	920	2.21
15.1-20	19.0	173	521	3.01	68	166	2.44	19	55	2.89	260	742	2.85
20.1-25	25.0	133	463	3.48	32	68	2.13	2	5	2.50	167	536	3.21
25.1-30	30.0	110	380	3.45	8	20	2.50				118	400	3.39
30.1-35	35.0	62	201	3.24	7	16	2.29				69	217	3.14
35.1-40	40.0	49	235	4.80							49	235	4.80
40.1-45	45.0	13	68	5.20							13	68	5.20
45.1-50	50.0	25	125	5.00							25	125	5.00
50.1-60	58.0	15	63	4.20							15	63	4.20
60.1-70	68.0	6	38	6.33							6	38	6.33
70.1-80	75.0	4	18	4.50							4	18	4.50
Total		1,181	3,213	2.72	611	1,129	1.85	206	359	1.74	1,998	4,701	2.35

Figure No. 3.

Showing the average number of cankers per infected tree in each crown class, and in all crown classes, plotted by height classes.



Height Classes of Pines in Feet.

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Infected Pines Dead.

Table No. 12 and Figure No. 4 give the number of trees killed by blister rust, and the percentage of infected trees killed, in each crown class by height classes.

In all crown classes, the highest percentage of infected trees killed occurs in trees 5 feet or less in height. In trees of greater height, the percentage of killed trees decreases. The largest tree killed by blister rust is a dominant, 25 feet in height. No intermediate trees taller than 10 feet were found killed. The highest percentage of damage in trees up to 10 feet in height is found in the overtopped crown class.

Occurrence of Cankers in Relation to Height of Surrounding Vegetation.

In Table No. 13, is given the relation of the height of each canker to the height of the surrounding vegetation, according to height class of the trees and also to the stage of development of the canker. In the case of trees growing in a dense stand, the term " height of surrounding vegetation" is synonymous with crown canopy; where the trees are isolated, it can only apply to the general vegetation surrounding the tree, such as brush and herbaceous growth.

An examination of Table No. 13 shows that 83% of the cankers were in the fruiting stage. The percentage of incipient cankers was highest in the smaller trees and least in the larger trees.

Nearly two-thirds of the cankers were produced below the level of the height of the surrounding vegetation. The percentage of cankers produced above was least in the small trees and increased in larger trees, until in trees 60 to 70 feet in height 76% of the cankers were above.

The percentage of fruiting and of incipient cankers above, 32% and 39% respectively, are not markedly different. In all but two height classes, however, the percentage of incipient cankers produced above is larger than the percentage of fruiting cankers produced above.

Summary

A study of the relation of crown class of white pines to blister rust infection was made on 8,556 white pines occurring on 30.75 acres of the Brackendale Plot No. 1.

Dominant, intermediate and overtopped white pines occurred in this stand in the ratio of approximately 5 to 3 to 2.

Infected pines were found to be most numerous in the dominant crown class and least numerous in the overtopped crown class. The percentage of dominant trees infected was found to be above the average for all three crown classes. The percentage of intermediate was slightly above this

average, and of overtopped trees was below the average.

The average number of cankers per infected tree generally increased with the height class. The average number of cankers per infected tree was practically coincident among the small trees of all crown classes, but in trees of over 2 feet in height the dominants consistently showed a greater number than the intermediates or overtopped.

In all crown classes the highest percentage of trees killed by blister rust was found to be in trees of 5 feet or less in height. Above this height, the overtopped crown class showed the highest percentage of trees killed.

Over 80% of the cankers examined were in the fruiting stage.

Nearly two-thirds of the cankers examined were found to occur below the height of the surrounding vegetation. The percentage of cankers produced above this height increased with the size of the trees.

Table No. 12
Number and Percentage of Trees Killed

Height Class, Feet	Dominant			Intermediate			Overtopped			Total		
	No. of Infected Trees	No. of Trees Dead	Percent of Infected Trees Dead	No. of Infected Trees	No. of Trees Dead	Percent of Infected Trees Dead	No. of Infected Trees	No. of Trees Dead	Percent of Infected Trees Dead	No. of Infected Trees	No. of Trees Dead	Percent of Infected Trees Dead
0 - 5	150	22	14.7	134	16	11.9	64	10	15.6	348	48	13.8
5.1 - 10	213	6	2.8	212	4	1.9	83	6	7.2	508	16	3.1
10.1 - 15	228	3	1.3	150	0	0	38	0	0	416	3	.7
15.1 - 20	173	1	.6	68	0	0	19	0	0	260	1	.4
20.1 - 25	133	1	.8	32	0	0	2	0	0	167	1	.6
Total	897	33	2.8	596	20	3.3	206	16	7.8	1699	69	3.5

Percentage of Infected Pines Dead.

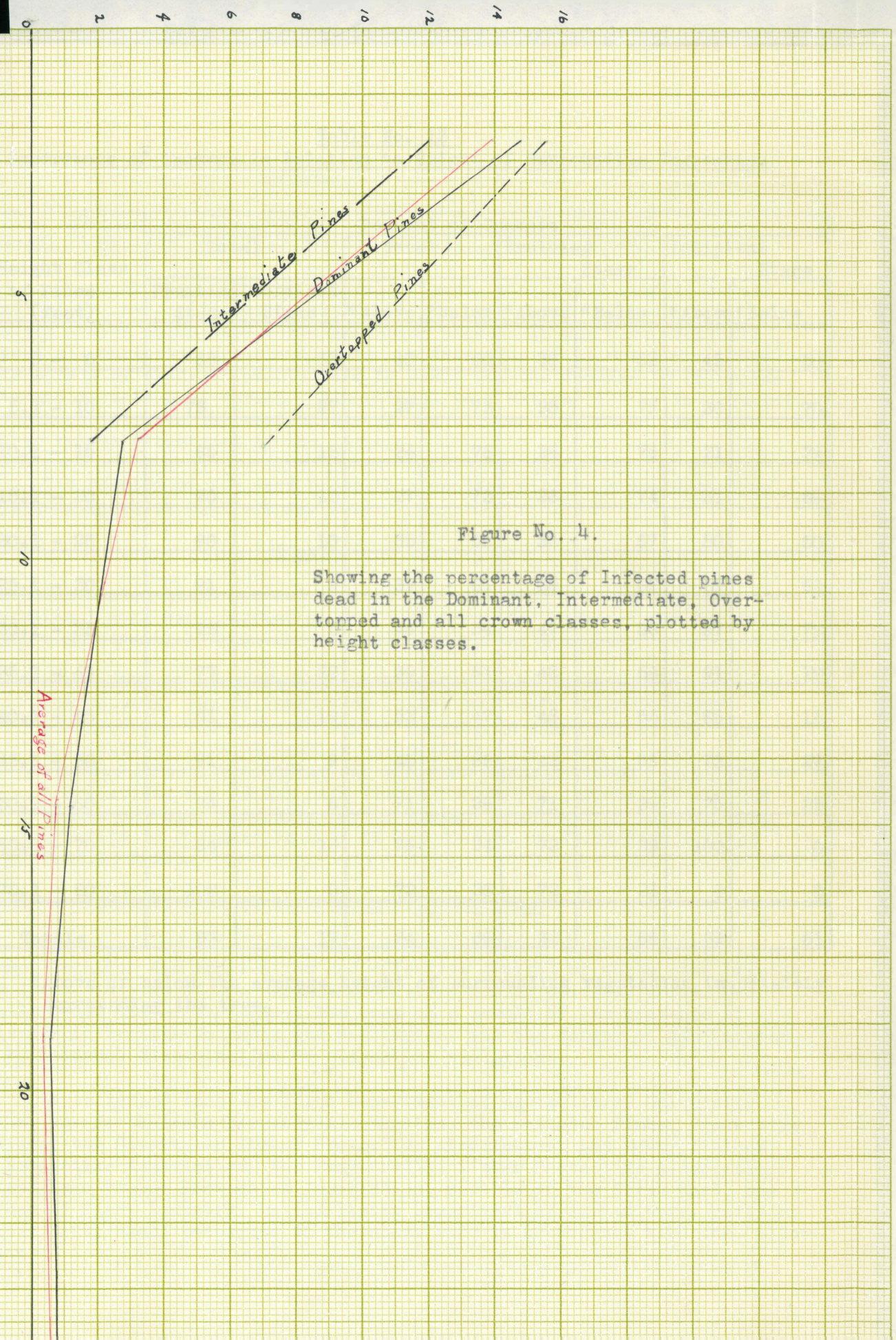

Figure No. 4.

Showing the percentage of Infected pines dead in the Dominant, Intermediate, Overtopped and all crown classes, plotted by height classes.

Table No. 13

Occurrence of Cankers in Relation to Height of Surrounding Vegetation

Height Class of Pines (Feet)	Percent of Cankers							
	Total		Total		Fruiting Stage		Incipient Stage	
	Fruiting Stage	Incipient Stage	*Above	*Below	*Above	*Below	*Above	*Below
0 - 5	68	32	40	60	38	62	45	55
5.1 - 10	73	27	27	73	25	75	30	70
10.1 - 15	85	15	24	76	24	76	21	79
15.1 - 20	90	10	27	73	26	74	31	69
20.1 - 25	90	10	35	65	33	67	50	50
25.1 - 30	91	9	39	61	38	62	39	61
30.1 - 35	95	5	46	54	47	53	27	73
35.1 - 40	77	23	39	61	42	58	81	19
40.1 - 45	81	19	53	47	45	55	85	15
45.1 - 50	91	9	45	55	42	58	73	27
50.1 - 60	94	6	71	29	71	29	75	25
60.1 - 70	84	16	76	24	72	28	100	0
70.1 - 80	100	0	72	28	72	28	0	0
Totals	83	17	34	66	32	68	39	61

*Above or below the average height of surrounding vegetation immediately surrounding the tree.

PROJECT 2

LOCATION AND ERADICATION OF CULTIVATED BLACK CURRANTS, NURSERY INSPECTION, SCOUTING FOR THE DISEASE, AND EDUCATIONAL WORK

In accordance with the general program, plans were laid to secure the eradication, as rapidly as possible, of the cultivated black currants in the western states which have white and sugar pines. It was also necessary to inspect all nurseries for the disease, to determine if it was being artificially spread by plant shipments, and to scout for the disease to determine its rate and direction of spread. Educational work was carried on to acquaint the general public with the seriousness of the blister rust menace and with the timber values threatened by the disease.

The results of the work under this project will be given according to the states in which the work was done.

Idaho

Cultivated black currant eradication, scouting for the disease, and educational work were carried on in Idaho under the terms of the following cooperative agreement, between the several cooperating agencies:

> MEMORANDUM OF UNDERSTANDING BETWEEN THE IDAHO DEPARTMENT OF AGRICULTURE, THE UNIVERSITY OF IDAHO, THE NORTH IDAHO FORESTRY ASSOCIATION, THE POTLATCH TIMBER PROTECTIVE ASSOCIATION, THE CLEARWATER TIMBER PROTECTIVE ASSOCIATION, THE COEUR D'ALENE TIMBER PROTECTIVE ASSOCIATION, THE PEND OREILLE TIMBER PROTECTIVE ASSOCIATION, THE PRIEST LAKE TIMBER PROTECTIVE ASSOCIATION AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE, RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN IDAHO.
>
> EFFECTIVE APRIL 1, 1923 to JUNE 30, 1924.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication and effective control of white pine blister rust in Idaho, in view of the threatened destruction of private, state, and nationally owned timber throughout the west as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by naturual dissemination or quarantine violations.

It is agreed that the Idaho Department of Agriculture, University of Idaho, the North Idaho Forestry Association, the Potlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, the Pend Oreille Timber Protective Association, the Priest Lake Timber Protective Association, parties of the first part, and the Bureau of Plant Industry, United States Department of Agriculture, party of the second part, shall cooperate to the above ends in accordance with the following plan:

1. The Idaho State Department of Agriculture and the Bureau of Plant Industry, United States Department of Agriculture, shall cooperate with the Federal Horticultural Board in the strict enforcement of State and Federal blister rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry shall pay the salaries and expenses and direct the work of one or more men who shall, during the proper season, inspect for violations of the Federal blister rust quarantines. These men shall also cooperate with the Idaho Department of Agriculture in enforcing State quarantines. For this purpose they will receive instructions in methods of procedure from the Idaho Department of Agriculture and shall be deputized to destroy plants shipped in violation of state quarantines.

2. The U. S. Bureau of Plant Industry shall, for the field season of 1923, pay the salaries and expenses of one or more men as scouts who shall do the necessary scouting for the disease and the locating of cultivated black currants in Idaho.

3. The Idaho State Department of Agriculture agrees to deputize these scouts mentioned in Section 2 and will invest in them the necessary authority to destroy cultivated black currants as provided for in Chapter No. 70, Idaho Session Laws of 1923. The Idaho State Department of Agriculture also agrees to reimburse such owners of cultivated black currants from monines provided for this purpose. The Idaho State Department of Agriculture still further agrees to pay the cost of printing such placards, posters or cards as might be necessary in order to facilitate the work.

4. The Idaho Department of Agriculture shall use their regular employees, so far as their other duties permit, in systematically locating cultivated black currants and infected blister rust host plants; in scouting for the blister rust; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. Such work will aggregate a total expenditure by the Idaho Department of Agriculture of approximately $5000.00 for the control of this disease for the period covered by this agreement. The expenditures of the U. S. Bureau of Plant Industry, indicated in previous paragraphs, will aggregate approximately $22,960.00 but none of the Federal funds shall be spent in compensation for plants destroyed in control work.

5. The School of Forestry, University of Idaho, recognizing the fact that white pine blister rust constitutes one of the most serious menaces to the future productive value of state, nationally, and privately owned timber lands, and that in order that the industry which it represents may be perpetuated, considers the question of the control of white pine blister rust as one of its major activities. The School of Forestry, University of Idaho, therefore agrees to detail Dr. Henry Schmitz to this work throughout the coming field season and to allow him sufficient time during the remainder of this year to supervise the work in general. The School of Forestry, University of Idaho, also agrees to furnish the necessary office space and equipment in its regular quarters for the proper carrying out of this work. The U. S. Bureau of Plant Industry shall take up all field expenses including transportation costs of

Dr. Henry Schmitz while actually engaged with supervision of this work. It is understood that he will spend three months, entire time and will after September 15th, supervise the work in a general way and when completed shall make such reports, plans and details as may be called for by the Idaho State Department of Agriculture and by the U. S. Bureau of Plant Industry. Furthermore, the School of Forestry, University of Idaho, in accordance with the recommendations made at the Portland Conference (1922) plans to make a study on the rate of growth of the western white pine remaining on areas after logging. The results obtained from this study will indicate the possibility of incurring expenditures for the protection of second growth white pine from blister rust. Professor Behre and three assistants will be engaged for three months on this work during the coming field season and it is planned to carry on this work for a sufficient number of years so that reliable data may be obtained. The work here outlined will aggregate a total expenditure on the part of the School of Forestry, University of Idaho, of approximately $3100.00 for the control and study of this disease for the period covered by this agreement.

6. The Department of Plant Pathology of the University of Idaho Agricultural Experiment Station agrees to examine all specimens suspected of being infected with the white pine blister rust when sent in by the field scouts and to keep the necessary records of such collections. It is also agreed that all specimens which are suspected of being infected with the blister rust shall be submitted to the U. S. Bureau of Plant Industry for final determination. Such work will aggregate a total expenditure on the part of the Department of Plant Pathology of the University of Idaho Agricultural Experiment Station of approximately $300.00 for the control of this disease for the period covered by this agreement.

7. The Extension Division of the University of Idaho College of Agriculture shall use its regular employees, in so far as their other duties may permit, in locating cultivated black currants and other infected or potentially infected blister rust host plants, and in giving publicity to the campaign to eradicate black currants and to other means for preventing the introduction and spread of white pine blister rust in Idaho.

8. The North Idaho Forestry Association, the Potlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, the Pend Oreille Timber Protective Association, and the Priest Lake Timber Protective Association, shall use their regular employees and the employees of their constituent timber protective associations, in so far as their other duties may permit, in systematically locating cultivated black currants and the scouting for the blister rust, and in locating infected or potentially infected host plants. Such work will aggregate a total expenditure on the part of the North Idaho Forestry Association and its constituent timber protective associations of approximately $11,500.00 for the control of this disease for the period of time covered by this agreement.

9. All official records of the work performed under this agreement shall be open to inspection by any or all parties to this agreement. All findings of the blister rust made by any part of this agreement shall be

promptly reported to all other portion to this agreement. All specimens collected by any party of this agreement, which are suspected to be infected with blister rust shall be submitted to the Department of Plant Pathology, University of Idaho, which will in turn forward them to the U. S. Bureau of Plant Industry for final determination. The U. S. Bureau of Plant Industry shall give such technical information to the employees of the parties to this agreement as will enable them to recognize the several stages of the disease.

10. It is understood that the U. S. Bureau of Plant Industry shall be primarily responsible for scouting and locating the blister rust in Idaho and for furnishing technical information on its control but that the Federal government has no authority to destroy private or state property and therefore that the Idaho State Department of Agriculture shall be wholly responsible for destroying such pines, currant and gooseberry plants as may be found necessary in order to control the spread of this disease in Idaho, including plants shipped in violation of State and Federal blister rust quarantines and regulations.

11. This memorandum of understanding shall take effect May 1, 1923, and continue in force until June 30, 1924, or until previously terminated by mutual consent of the parties to this agreement.

Date	Signatures	Estimated Value of Cooperative Work. (Half Available for 1923, Half for 1924.)
May 1, 1923	(S.) M. A. Means Commissioner, Idaho Department of Agriculture.	$ 5,000.00
May 1, 1923	(S.) M. L. Dean Director, Bureau of Plant Industry Idaho Department of Agriculture.	$
May 1, 1923	(S.) F. G. Miller Dean, School of Forestry, University of Idaho.	$ 3,100.00
May 1, 1923	(S) E. J. Iddings Director, Agriculture Experiment Station, University of Idaho.	$
May 1, 1923	(S.) L. W. Fluharty Director of Extension Division of the College of Agriculture, University of Idaho.	$

(Continued)

Date	Signatures	Estimated Value of Cooperative Work. (Half Available for 1923, Half for 1924)
May 1, 1923	(S) C. W. Hungerford Pathologist, Agricultural Experiment Station, University of Idaho.	$ 300.00
May 1, 1923	(S) A. W. Laird President, North Idaho Forestry Association.	$
May 1, 1923	(S) W. D. Humiston Secretary, Potlatch Timber Protective Association.	$
May 1, 1923	(S) T. J. Humbird President, Clearwater Protective Timber Association.	$
May 1, 1923	(S) J. P. McGoldrick President Coeur d'Alene Timber Protective Association.	$11,750.00
May 1, 1923	(S) B. H. Hariby President, Pend Oreille Timber Protective Association.	$
May 1, 1923	(S) Ben E. Bush President, Priest River Timber Protective Association.	$
May 1, 1923	(S) W. A. Taylor Chief, Bureau of Plant Industry, U. S. Department of Agriculture.	$

Cultivated Black Currant Eradication.

The Legislature of the State of Idaho, in its 1923 Session, appropriated the sum of $5,000 for the control of white pine blister rust within the state. $1,000 of this sum was designated as compensation for cultivated black currants destroyed. In order to establish a standard rate of compensation the Executive Committee for Idaho of the Western White Pine Blister Rust Conference recommended a definite scale for compensation to owners of destroyed cultivated black currant plants. This scale of compensation was approved by the Commissioner of Agriculture, and compensation has been given throughout the season on the following basis:

Healthy plants, given voluntarily.....5¢ each.

Neglected plants.....5¢ "

Fruiting plants, run down by age and lack of care.....25¢ "

Fruiting plants, 2-4 years old, good state of cultivation.....35¢ "

Fruiting plants 4 years old and over, good state of cultivation.....50¢ "

The eradication of cultivated black currants in Idaho has been carried on under provision of the following quarantine orders:

QUARANTINE ORDER A.

Pertaining to Cultivated Black Currants.

The following facts have been determined by the Commissioner of Agriculture, to-wit:

WHEREAS, the fact has been determined that the dangerous and injurious disease known as the White Pine Blister Rust (Peridermium strobi Kleb) now exists in the western part of the State of Washington, and in the Province of British Columbia, and

WHEREAS, There is danger that this disease may be introduced into the valuable forests of Western White Pine (Pinus monticola) in Idaho, and

WHEREAS, It has been further determined that the cultivated black currant (Ribes nigrum and its varieties) are the most dangerous alternate host plants of this disease, and that the occurrence of the plant in the State of Idaho constitutes a direct menace to the white pine forests.

NOW, THEREFORE, I, Mark A. Means, Commissioner of Agriculture of the State of Idaho, by virtue of the authority vested in me by Chapter 113, Sessions Laws of 1923, do hereby proclaim the cultivated black currant (Ribes nigrum and its varieties) to be a public nuisance in the State of Idaho. The destruction of these plants is hereby ordered in the State of Idaho, and it shall be unlawful for any person to possess, propagate, sell or offer for sale, these plants in the State of Idaho. In addition, I do hereby declare and proclaim a quarantine prohibiting the shipment or movement of any cultivated black currant plants (Ribes nigrum and its varieties) into or within the State of Idaho. All horticultural inspectors are hereby ordered and instructed to intercept, condemn, destroy or return

to the shipper, any movement or shipment of cultivated black currants into or within the State of Idaho, and to condemn and destroy any black currants found growing in the State of Idaho. Any violation of these orders will be dealt with according to law.

This order shall take effect and be in force on and after the first day of May, 1923.

EXTENSION OF QUARANTINE
ORDER A

Pertaining to White Pine Blister Rust

WHEREAS, By a quarantine order issued February 7, 1922, the importation of all White Pine (Pinus strobus), Western White Pine (P. monticola), Stone Pine (P. cembra), Limber Pine (P. flexilis) or any other five leaved pines, Currant and Gooseberry plants (Ribes and Grossularia) from the Province of British Columbia and that part of the State of Washington lying west of the crest of the Cascade Mountains is prohibited; and

WHEREAS, The State of Washington has so modified its existing quarantine laws as to permit the free movement within the State of Washington of all Currants and Gooseberries except the cultivated Black Currants (Ribes nigrum and its varieties) and thus increasing the danger of spreading the disease within the State of Washington, and

WHEREAS, White Pine Blister Rust is not known to have spread generally to that portion of Washington lying west of the crest of the Cascade Mountains and

WHEREAS, White Pine Blister Rust is now known to be present in Eastern British Columbia and elsewhere in that Province:

THEREFORE, IT IS HEREBY ORDERED, That said quarantine order of February 7, 1922, be so extended that the entire State of Washington and all of Canada shall be included in the operation of said quarantine.

* * *

The eradication of cultivated black currants in Idaho was carried on under the immediate supervision of Dr. H. Schmitz, of the School of Forestry, University of Idaho. Dr. Schmitz's services, together with office facilities, have constituted a portion of the cooperative assistance given to the Idaho blister rust program by the University of Idaho.

For the period May 15 to August 31, 3 two-man crews were in the field in Idaho, locating and eradicating cultivated black currants. For this season, the work was confined to the ten northern counties of the state.

The following tabulation gives the results of the cultivated black currant eradication in Idaho for the past season.

Table 14
Status Cultivated Black Currant Eradication Work,
Idaho, November 30, 1923

County	Eradicated		Not Eradicated		Total	
	Plantings	Plants	Plantings	Plants	Plantings	Plants
Benewah	10	82	-	-	10	82
Bonner	56	264	4*	21*	60	285
Boundary	19	93	-	-	19	93
Clearwater	8	60	-	-	8	60
Idaho	15	73	1#	2#	16	75
Kootenay	70	364	-	-	70	364
Latah	50	195	1#	23#	51	218
Lewis	16	68	-	-	16	68
Nez Perce	18	70	-	-	18	70
Shoshone	7	23	-	-	7	23
Total	269	1,292	6	46	275	1,338

*These plantings located after close of scouting season.

#These cases are pending, awaiting further investigation.

The following tabulations give the status of these cultivated black currant plantings and plants according to the compensation paid.

Table 15

Status	Eradicated		Not Eradicated	
	Plantings	Plants	Plantings	Plants
Donated (5¢ per bush)	225½	842		
Not Donated	33½	398		
Cases Pending	10	52	6	46
Total	269	1,292	6	46

Table 16

Amount Paid per Bush	Eradicated		Not Eradicated		Total Paid
	Plantings	Plants	Plantings	Plants	
5¢	225½	842			$ 42.10
10¢	1	20			2.00
25¢	5½	73			18.25
35¢	17½	238			83.30
50¢	8½	66			33.00
75¢	1	1			.75
Pending	10	52	6	46	
Total	269	1,292	6	46	$179.40

For the 269 plantings, containing 1292 bushes, a total of $179.40 has been recommended for compensation. This gives an average of 15-4/10¢ per bush. Out of the total amount of $179.40, $42.10 was paid for donated bushes, at the rate of 5¢ per bush. This leaves a total of $137.30 paid for bushes for which compensation was demanded. It is further noted that approximately 87% of the owners donated their bushes, while 13% demanded compensation.

Educational Work

The Forest Service held five district schools for rangers and smoke chasers on the Clearwater National Forest during June. At each of these schools blister rust was explained to the men and an effort was made to familiarize them with the wild Ribes in that section. The five meetings included about seventy-five men. Preliminary steps were taken for a Ribes survey by the members of the Forest staff. A definite plan of procedure was worked out. The entire responsibility for carrying on the survey was left in the hands of the supervisor because no blister rust man was available to supervise the work.

Some educational work was done in each of the four protective associations of northern Idaho. Exhibits of the blister rust were placed at the headquarters of each of the associations. A meeting of all of the members of the Pend Oreille association was held at Sandpoint, Idaho. Twenty-four men were present. A discussion of blister rust accompanied with slides was given at this meeting. Considerable time in personal work was given to the Potlatch Association. Sixteen stations were visited. Scouting was done along 321 miles of trail between these points. Seventy-eight men were instructed regarding blister rust.

The following publicity material was issued by Dr. Schmitz:

(1) A discussion of the Blister Rust problem - Exhibit 1 - was presented to the Moscow Rotary Club.

(2) As a result of this discussion the Moscow Rotary Club sent out a letter to all the Rotary Clubs in Idaho concerning the Blister Rust - Exhibit 2.

(3) In the "Program for Forest Protection Week in Idaho", April 22-28, 1923 an article concerning Blister Rust - Exhibit 3 - was included. This circular was sent to all schools, churches and clubs in the state.

(4) In the annual issue of the "Idaho Forester" for 1923, Page 25 Exhibit 4 concerning Blister Rust was printed. About 3000 copies of this bulletin were issued to a selected mailing list.

(5) Exhibit 5 was published in the University of Washington "Forestry Quarterly" under the title "State Lines vs: the Common Interest". It was also issued under the present title as a separate article and distributed generally to lumbermen in the Inland Empire.

Exhibit 1.

ROTARIANS OF MOSCOW, IDAHO.

It is not difficult to be popular as a speaker providing one always tells one's audience that which they like to hear. This I might also do. It would be entirely possible to paint a very rosy picture of what the lumber industry means to the State of Idaho, the number of people it employs and the wealth it is bringing into this state and conclude with the final statement that the industry will continue to thrive at its present magnitude for some years to come. We have had too much of this type of information and I proceed under the assumption that you gentlemen are not only interested in today, but also to some extent in tomorrow and that you wish to know the truth whether it is pleasant to hear or not.

Today the lumber industry is one of Idaho's leading industries. It employs sixty percent of the entire industrial population. It pays $18,000,000 annually in wages in addition to $4,000,000 for supplies. It represents an invested capital of $50,000,000 and produces annually a product worth $30,000,000. Last, but not least, it pays $1,000,000 annually in taxes. In short, north Idaho is a good place for you and me to live,-and mainly on account of the forest. But let us look at tomorrow.

Whenever one considers the probable conditions in a city, county, state or nation fifty years hence, one must perforce base ones predictions more or less on what has happened in the past. Therefore, in order to predict what the probable conditions in north Idaho will be thirty or forty years from now, I will refer to the conditions now existing in a state which in 1885 was the most important lumber producing state in the Union. The peninsula of northern Michigan and the panhandle of Idaho have, as far as we are now concerned, much in common in that both regions originally possessed enormous timber wealth and in that little of the land in either area is agricultural. I therefore feel that, provided an adequate forest policy in the state of Idaho is not adopted in the near future, we are practically certain to have the same conditions existing in north Idaho thirty or forty years from now as now exist in the peninsula of the state of Michigan.

Lumbering started in Michigan in earnest immediately after the Civil War. The north central and prairie states were populated with extraordinary rapidity; cities sprang up like magic; railroads were stretched across the plains; and flanking them and streaming behind came settlers. Much lumber was needed, and the one place where a superior grade of building material could be obtained in limitless quantities, was the remarkable white pine stand in the northern peninsula of Michigan. There were no railroads into that region until about 1880; logs were driven down the rivers in the spring to the mills situated on the Great Lakes. Thus were the great mill towns developed; Bay City, Saginaw, Au Sable, Alpena, Cheboygan, Manistee, Ludington, and Muskegon. Surprisingly small streams

were dammed and flooded with logs. Lumber camps were everywhere in the woods. It is probable that each year between 1885 and 1890 there were perhaps 800 camps operating in the region. Very few believed that the forest reservior could be emptied. Every political speech resounded with broad phrases, ebullient, optimistic, regarding the inexhaustible timber wealth of the state, and every Michigander fully believed that no region could rival Michigan in forests.

A wonderful story of development. The results however are tragic. From 1910 to 1920, twenty-three counties of the state lost more than 10% in population. The maximum decrease in population being no less than 34.7%. All of these are in the devastated debauched forest region. Is not this marked decrease in population ample evidence of terrible economic conditions of that region?

This decrease in population is not all nor is it the worst. One of the most sorry results of the heedless exploitation of the region is the effect upon the social conditions of many of the inhabitants who had to remain. We find farmers, tradesmen, doctors, lawyers, teachers, caught in the ebbing tide of prosperity without enough money to get out to start business anew. They remain, nearly destitute and with the certain knowledge that as years go on their lot can only become worse.

Another good indication of the conditions in that section is the amount of railroad track abandoned. Since 1891, 1156.2 miles of track have been abandoned. It would cost over $18,000,000 to replace this track.

The tax situation is also anything but encouraging. From 6,000,000 acres about $750,000 of taxes are obtained. If it were forest, and the tax rate the same, $7,500,000 might be collected. In many of the towns in the devastated belt taxes rose from 50 to 100% from 1921 to 1919. In 1918, 25 of the 27 counties in the peninsula drew out more money from the state treasury for the maintenance of their primary schools than they paid into it in the form of state taxes. Several counties failed materially to meet the burden of state tax apportioned to them. Alcona County paid only 73% of its state tax. Benzie 81%, Lake 72%, Rosecommon, 54%. The area as a whole defaulted by about 12% compared with the four percent for the rest of the state.

Shift this entire scene to north Idaho, double or trebble the intensity of the depression and you will have a picture of our fair state in 1950 or 1960, provided nothing is done. Idaho will be in a much sadder plight than Michigan on account of the lack of manufacturing. Do not deceive yourselves that the situation will somehow take care of itself,-look at northern Michigan. Do not deceive yourself that the bulk of these logged off lands can be used for agriculture,-

no well-informed, intelligent individual even dreams of such a thing. Do not deceive yourselves that the forest will replace itself even though neglected. In by far the great majority of cases, it will not and there is ample evidence to prove that it will not. I predict that many of you will see the beginning of the decline of some of the towns in north Idaho,- even now it is too late to avert disaster in some regions.

This is not a cheerful future,-and is worthy of careful study by any citizen of the state of Idaho who has the best interest of the state at heart. Under present conditions, and by present conditions I merely refer to the lack of an adequate forest policy. There are two factors, as I see it, which can forstall the full and crushing effect of a disaster such as we note in Michigan; namely, the United States Forest Service and the intelligent administration of the state owned timber lands. Citizens of the state of Idaho should point with pride to the able administration of their state lands at the hands of Mr. Bush.

Finally we come to the question of what can be done to avert an economic catastrophe as we have witnessed in Michigan. Personally I have always felt that as soon as the people realize what the lumber industry means to the state and nation, they will demand that legislation be enacted for the purpose of perpetuating the industry. Therefore, I say to you that it is most important that you inform yourselves concerning the forests and forestry and after you have informed yourselves and arrived at some opinion, demand that adequate forestry legislation be enacted. You will find that the lumbermen of this state are progressive, wide awake, well informed individuals, many of whom have shown themselves ready to cooperate on any reasonable plan of conservation even though that cooperation costs them actually money. Personally I take no little pride in broadcasting the caliber of the lumbermen of our state.

You say you are interested,-that you wish to do something. A very serious menace is confronting the forests of north Idaho and unless immediate action is taken the devastation will be almost as complete as it has been in Michigan and the state and communities will not even have profited temporarily. White pine blister rust,- a serious disease of white pine, is menancing the entire lumber industry of north Idaho. White pine is the key tree of the lumber industry in this region. Without it, the mixed species are worthless. The disease can be controlled. At the suggestion of the White Pine Blister Rust Control Executive Committee for Idaho, a ten year program for the control of this disease has been prepared. It has the endorsement of all concerned but it is going to require a big push to put the thing across. The whole idea is the protection of Idaho's

white pine and the perpetuation of Idaho's industry. Are you interested? If so, let your congressional delegation know of your interest. Let your sister Rotary Clubs know of your interest and request them to take action. Gentlemen, the situation is serious and there is work for you to do not only as an organization, but as individuals.

ROTARY CLUB OF MOSCOW, IDAHO

----------, Secretary,
Rotary Club,
----------, Idaho

Dear Sir:

At our regular meeting held August 13, Dr. Henry Schmitz of the School of Forestry, University of Idaho, gave us a short talk concerning the importance of the lumber industry to the prosperity of Idaho and informed us that white pine blister rust, a serious disease of white pine, will seriously cripple the lumber industry in a few years if not controlled.

Moscow Rotarians feel that an industry which employs 2/3 of the state industrial population, which produces 1/2 of the manufactured products, which pays $1,000,000 in taxes and ranks first in employment of wage earners, must certainly be perpetuated. We believe that you share with us the view that every effort must be made to control a pest which will undermine the very foundation upon which the prosperity of our state rests.

We are advised that a ten-year program has been drawn up which will secure practical protection of the commercial white pine in the Inland Empire on State, Federal and private holdings. The success of this program depends upon federal appropriations of known amount running over a period of years. It is felt that this is the only way in which efficient economical protection can be obtained. The general idea has the whole hearted support of the private operators, state officials, foresters and plant pathologists.

May we count on your club to endorse this important work and as a positive indication of your interest, may we count on you to advise our Congressional Delegation of your interest and that you wish to see this serious disease of white pine controlled and our lumber industry thus perpetuated?

We can assure you we would very much appreciate a reply from you advising us what action you have taken in this matter.

Very sincerely yours,

C. J. Hugo, Secretary.

THE WHITE PINE BLISTER RUST MENACE

About 25 years ago a European forester warned the United States as to what might be expected if they continued to import white pine seedlings from Europe and thus make possible the introduction of white pine blister rust in this country. Nothing was done. In 1906, it was first found in the United States at Geneva, New York, and now, as far as we know, the white pine areas of Idaho and California are the only two regions in which white pine is an important timber tree where blister rust is not present. Several million dollars have already been spent in combating this disease and damage amounting to many millions of dollars have been done. If at all possible then, let us by all means keep it out of Idaho. Before discussing how this can best be done it will be necessary to take up briefly the life history of the pest.

White pine blister rust is a destructive disease of white pines, i.e., those pines which bear their needles in bundles of five. It is caused by a fungus which can attack the pines only after it has grown on the leaves of wild or cultivated currant or gooseberry bushes. While on the pines the blister rust fungus lives in the bark. At first its presence is not noticeable, but slowly the bark swells and within several years from the time of infection, the blisters from which the disease gets its name push through the bark early in spring.

These sacs break open and liberate millions of yellow spores (like seeds) which are carried about by the wind and infect the leaves of currant and gooseberry plants. Here the disease appears in early summer as a yellow rust on the under side of the leaves. The spores from this stage cannot infect the pines, but are blown about and infect other currant and gooseberry leaves. Later in the same season the late summer stage of the rust appears on the diseased leaves. This consists of numerous small, brown hairlike projections, likewise on the lower leaf surfaces. The spores from this stage cannot infect currant or gooseberry leaves, but when blown to a white pine tree, they infect it, thus completing the life cycle of the fungus. This disease kills the pines by working in the bark and girdling the tree. Its effect is slow, but very deadly. In general, a small tree will be killed in a shorter time than a large one, but the large tree is no more resistant to infection and ultimate death than the smallest seedling.

It is then seen that currants and gooseberries are necessary for this pest to spread. Not all currants and gooseberries however, are equally effective in facilitating the spread of the disease. The cultivated English black currant is the prime offender and should be considered as the arch enemy of white pine. The most effective way then to protect our most valuable timber crop against this disease is by getting rid of all the cultivated English black currants in and around the white pine region.

You have a certain duty to perform in this connection and it is briefly this; if you know where there are any cultivated English black currants anywhere within the state, write to the School of Forestry, University of Idaho, telling them just where they are located. In this way you will be rendering no small amount of service in helping protect one of Idaho's most important industries.

THE PRESENT STATUS OF WHITE PINE BLISTER RUST IN THE WEST WITH SPECIAL REFERENCE TO THE WHITE PINE IN THE STATE OF IDAHO

By Henry Schmitz
Associate Professor of Forest Products and Agent. Office of White Pine Blister Rust Control, U. S. D. A.

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It is a fact that the forests of Idaho constitute one of the states most important resources. Furthermore, it is also a fact that under the existing economic conditions the State of Idaho cannot have any marked degree of prosperity without the lumber industry. It is imperative, therefore, particularly from the standpoint of the future that the forests should be perpetuated. Three factors militate against perpetuating the forests, namely, destructive logging, fire and disease. In many respects destructive logging is of the least importance since it can easily be controlled and the state and community profit at least temporarily by utilization of the forest crop. In the case of both fire and disease, no one profits even temporarily. Moreover, both necessitate the expenditure of considerable money if they are to be controlled. Of the two, fire and disease, disease is in many respects the harder to control. The above statement should not be interpreted as a defense for destructive lumbering. The only purpose in making the statement is to substantiate the contention that of the three destructive factors, disease is at least equally as important as any other.

In many respects, plant diseases have much in common with animal diseases. There are those diseases both of plants and of animals, which are with us always. They do their damage, take their toll and continue to be with us. On the other hand, there are those diseases which visit us but seldom,-the causes of epidemics, plagues, calamities,- which leave destruction and desolation in their path. Such a disease of plant life is chestnut blight which practically wiped out chestnut in eastern United States in a brief period of about fifteen years. Such a disease is white pine blister rust, which unless controlled, now threatens to destroy Idaho's most valuable timber tree,-white pine.

Since the discovery of white pine blister rust in the west in 1920, considerable information concerning the disease under western conditions has been collected by the Office of White Pine Blister Rust Control and to some extent by other agencies. It is from the above sources that the information herein contained was obtained.

Although there is still a little doubt as to the exact time when blister rust was introduced into the west, the evidence strongly indicates that as far as is now known, it was first produced in 1910 on a shipment of Pinus strobus seedlings from Ussy, France. There is also

considerable evidence to show that the disease might have been brought into the northwest at several different times but the above mentioned case is apparently the earliest.

Since the time of its introduction, blister rust has made rapid progress in its spread especially in a northeasterly direction. This is undoubtedly not only due to the fact that during the spring and early summer the general direction of rain bearing winds is from the southwest, but also to the fact that cultivated black currants are more common to the northeast. It is also during this late spring and early summer period that most of the aeciospores are produced. From the probable original point of infection, which is Vancouver, British Columbia, blister rust has now spread as far south as Ilwaco, Pacific County, Washington, and north to the northern limits of the range of western white pine, a distance of practically 150 miles in both directions. In all probability, the infection found at Revelstoke, British Columbia, is a distinct introduction of the disease and not connected with the Vancouver infection. If the Revelstoke infection spreads towards the south as rapidly as the disease has spread on the Pacific Coast, the disease will be entrenched in the heart of the white pine area of the north Idaho by 1935. It is possible also, unless the greatest care is taken in the enforcement of existing quarantine regulations, that the disease may be introduced into Idaho by artificial means at a much earlier date.

Some of the most important data collected by the Office of White Pine Blister Rust Control are those concerning the relative susceptibility of various species of currants and gooseberries to the disease under Pacific Coast conditions. Based upon his observations on naturally infected Ribes in the northwest, Dr. Pennington has placed them in the following order with reference to their apparent susceptibility and probable capacity to become infected from a far distant pine infection: R. nigrum, R. bracteosum, R. sanguineum, R. divaricatum, R. laxiflorum, R. lacustre, R. vulgare, R. viscosissimum and R. lobbii. From the point of view of establishing the disease in a new locality, R. nigrum (the cultivated black currant and its varieties) is the greatest importance not only because it is most susceptible to the disease but also because it usually stands exposed in gardens and is not shielded by the surrounding vegetation as are the native species in the forest. For these reasons it is absolutely essential, in order to keep the disease out of Idaho, that all cultivated black currants in the state be destroyed at once.

There is another point in connection with the cultivated black currants which is worthy of mention. Blister rust can spread from most varieties of currant and gooseberries to pine only for a distance, under most conditions, of 300 yards while the disease may spread from the cultivated black currant to pine for a distance of at least one mile.

The question of the probable damage this disease will cause to western white pine is of greatest interest and the data so far collected are anything but encouraging. For example, the data gathered on a sample plot at Daisey Lake indicate that 96 per cent of the white pine on the plot will have been killed ten years after infection. The trees on this particular plot were infected in 1915 and 1916 and by the spring of 1922, or about six years after infection, 40 per cent of the trees had already been killed.

That western white pine is very susceptible to the disease is shown by the fact that many of the infected trees show an unusual number of cankers. For example, a 36 year old tree in the Daisey Lake region had 353 cankers or an average of seven per branch. Another tree 28 years old had 316 cankers or an average of 10 per branch. These figures, although high are not unusual and do not give an exaggerated idea of the severity of the infection. On account of thefact that infected trees usually have such an enormous number of cankers, death of the tree usually results from the killing of the branches rather than from the girdling of the tree trunk by a stem canker. From the standpoint of the mature western white pine in the Inland Empire this has a serious aspect since it does not seem unreasonable to suppose that these mature trees may be killed in a similar manner. It has been generally supposed that it would take quite a few years for blister rust to kill these mature trees even after they had become infected but there is little evidence in support of this supposition.

In order to postpone as long as possible, the day when blister rust will finally get into Idaho and in order that it may be controlled after it does get it, the best efforts of private, state and federal agencies are required. The general public itself has a part to play in this program, - a duty to perform. The most important immediate step is to free the state of all cultivated black currants. Almost equally as important is the strict observance of state and federal quarantine laws. Do not transport or receive currants or gooseberries or white pines from regions where blister rust is known or suspected to be present.

If these two steps are taken we can at least hope to keep blister rust out of Idaho for some time.

Exhibit 5.

WHAT THE STATE OF WASHINGTON MUST DO IF THE FIGHT TO SAVE THE WHITE PINE IN THE INLAND EMPIRE FROM WHITE PINE BLISTER RUST IS TO BE SUCCESSFUL

by
Henry Schmitz
Associate Professor of Forest Products, University of Idaho, Moscow, Idaho

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Only a year ago forest pathologists felt generally that the remarkable white pine stands of Idaho were in no immediate danger as a result of the lately discovered infection of white pine blister rust in northwestern Washington and southwestern British Columbia. As far as we then knew, white pine blister rust did not exist in British Columbia east of the so called dry belt and the belief that this dry belt would act as an effective barrier against the eastward spread of the disease was not without good foundation.

Thus, we in Idaho, remained in a state of blissful ignorance until early in September 1922 when the Western Office of White Pine Blister Rust Control, cooperating with Provincial Department of Agriculture, reported the discovery of white pine blister rust at Revelstoke, B. C. Scouting in that area soon revealed the fact that the infection covered a considerable area and that it was quite impossible to wipe it out. Thus the complexion of the situation was entirely changed. Idaho's nineteen billion feet of white pine conservatively valued at $190,000,000 on the stump were in immediate danger as the disease could spread in an uninterrupted path of white pine and currants from Revelstoke to Idaho. Instead of considering precautionary measures, it now became necessary to take immediate action if control measures were to be effective to any extent.

Let us pause a moment and figure what the harvest would be in Idaho provided no control measures whatsoever were undertaken. We now have enough data on the disease under western conditions so that we know about what to expect when the disease gets to Idaho. If the disease spreads at the same rate in the Inland Empire as it has done on the coast, the white pine stands of Idaho will have been generally infected in about ten years. There is also a possibility that the disease may be brought into this state by artificial means and in this event, the above estimated time may be cut in half. In a ten year period, at the present rate of cutting, some 2,404,560 M feet of white pine will be cut leaving some 16,500,000 M feet to be killed by white pine blister rust. Much of the remaining timber will be in the more or less inaccessible places and it will be impossible to get it out after it has been killed by the blister rust organism and before

it is destroyed by insects and the wood destroying fungi. Even assuming that all of this white pine were accessible - what then? It takes the blister rust about ten years to kill all the trees in an infected stand. This being true, all of the pine would have to be cut in ten years or at the rate of about 1,650,000 M feet per year or about eight times as fast as at present. The market is well supplied at the present rate of cutting; to increase the rate to eight times the present could only have one effect, flooding the market and breaking the price. The margin of profit in the lumber industry is not large even at present prices. Break the price of white pine and you paralize the industry. This is the ultimate result.

This is not all nor is it the worst. White pine is the key tree to the lumber industry in the Inland Empire. Without it, in most cases, the mixed species are worthless. In short the following is what white pine blister rust can do for Idaho: It can cause a loss of 147 million dollars on the national forests, a loss of 84 million dollars on privately owned land, a loss of 27 million dollars on state owned land, a loss of 1 million dollars on Indian reservation land, it can destroy an industry which employs 2/3 of the states industrial population, which produces 1/2 of the manufactured products, which pays one million dollars taxes, which pays 18 million dollars annually in wages and 4 million dollars in supplies. Figuring on an average expenditure of $20 per 1000 feet of lumber manufactured, white pine blister rust threatens to destroy property which would in the aggregate pay out $1,118,100,000 in wages and supplies in its manufacture. In other words, the loss of the lumber industry will make a veritable industrial desert of north Idaho.

"Based on stand of timber north of Salmon River.

This enormous loss will be felt beyond the borders of the state of Idaho. Eastern Washington in particular will feel the loss almost as keenly as Idaho, herself.

Naturally enough the blister rust situation is the cause of no little apprehension to the citizens of the state of Idaho and it should be the cause of no little apprehension to all citizens of the entire United States as well, especially those of the western states. White pine blister rust does not recognize state borders in its activities. Neither must state borders be recognized when control measures are undertaken. Every state must expect to do its part irrespective of the timber values it, itself, has at stake. Thus, Idaho can rightly expect the State of Washington to do its part in the control of this disease.

Without entering into an argument of a controversial nature without considering what political expedience may dedicate, I personally feel that the following are the steps which the State of Washington should take in the blister rust control program and which every forester, lumberman, friend of conservation and broadminded citizen should support:

1. It should support the ten year blister rust control program.

2. It should prevent the movement of all currants and gooseberries from western to eastern Washington.

3. It should declare cultivated black currants a public nuisance and order their immediate destruction in the following counties Okanogan, Ferry, Stevens, Pend Oreille, Lincoln, Spokane, Adams, Whitman, Columbia, Garfield and Asotin.

4. It should make every effort to see that Idaho quarantines regulations relating to white pine blister rust control are respected.

5. It should, through its regular state force, keep a constant watch for blister rust infections in any part of the state and immediately inform the Federal Office of White Pine Blister Rust Control of this situation.

The ten year program for white pine blister rust control was drawn up at the suggestion of the Executive Committee for White Pine Blister Rust Control at Idaho. This program has as its chief aim the protection of all the commercial white pine stands in the west, including the sugar pine stands of California. The plan has the endorsement of all concerned but it is going to take the united effort of all the western states to make Congress realize that the west wants this bill passed. According to the provisions of this bill, a certain appropriation will be made each year for a period of ten years. Thus it will be possible to do the work more efficiently and more economically. The work can be planned with the certain knowledge that a definite sum will be available for the work.

It must be obvious to all who are familiar with the life history of this disease that the movement of all currants and gooseberries or white pines from the infected area west of the Cascades to any region east of the Cascades, will eventually introduce the disease in eastern Washington. This is not conjecture - it is fact, and is borne out by all past records. After the disease becomes established in eastern Washington, it will practically take no time to reach Idaho. By permitting the free movement of the above plants within the state, it is possible to bring the disease from the infected area to the very borders of Idaho. Idaho, although full well realizing the fact that eventually she will have the actual disease to contend with, is at present most vitally interested in keeping it out of the state for as long a period as possible. A few years delay in the time the disease reaches Idaho is worth millions of dollars to the lumber industry. Surely a state is entitled to this much consideration from its neighbors.

In order that the measures taken by Idaho for the purpose of delaying the date of entry of white pine blister rust may be effective, it is absolutely necessary that there be a zone along the eastern edge

of the State of Washington which is free of cultivated black currants. Cultivated black currants in Washington near the state line constitute as great a menace to Idaho's white pine as if they were actually in the state of Idaho. How wide this currant-free zone should be is a matter of opinion. It is, however, a fact that the wider it is the more effective and safer it will be. In the opinion of the writer, a zone including the counties previously mentioned, should be effective, reasonable and take into consideration due regard of the probable path of the disease from Revelstoke, B. C., to Idaho.

There can be no arguement that it is only right for officials of the State of Washington to make a reasonable effort to prevent its citizens violating quarantine laws enforced by the State of Idaho. The difficulties attending adequate quarantine inspection are too well known to need further comment and any assistance which can be given to us in preventing the shipment of prohibited plants into Idaho, will be appreciated.

The State of Idaho is not calling on her sister states to help her protect her white pine forests and in the meantime doing nothing herself. Far from it. Idaho realizes that she must take the lead in this fight and there has never been the least disposition on the part of any state or private agency to shirk their duty or delegate their responsibility. The last session of the Idaho legislature passed a law giving the Commissioner of Agriculture authority to declare cultivated black currants a public nuisance which he has done. It also made an appropriation of $5000 to be administered by the Commissioner of Agriculture, for blister rust control work. Owners who have had their cultivated black currants destroyed are reimbursed from this fund. The destruction of cultivated black currants in Idaho is naturally being done under the authority of the Commissioner of Agriculture. The Idaho State Department of Agriculture is also using its regular employees, so far as their other duties permit in locating cultivated black currants and infected or potentially infected blister rust host plants, in scouting for blister; in inspecting nurseries for this disease and in enforcing state and federal blister rust quarantines.

The School of Forestry, University of Idaho, recognizing the fact that white pine blister rust constitutes one of the most serious menaces to the future productive value of state, nationally and privately owned timber lands and in order that the industry which it represents may be perpetuated, considers the question of control of white pine blister rust as one of its major activities. To this end it has detailed the writer to this work throughout the past two summers and has allowed him sufficient time during the remainder of the year to supervise the work in general. The School of Forestry, also furnishes the necessary office space and equipment in its regular quarters for the proper carrying out of this work. Furthermore, in accordance with the recommendations made at the

Portland Conference (1922) it is making a study on the rate of growth of western white pine remaining on areas after logging. The results obtained from this study will indicate the possibility of incurring expenditures for the protection of second growth white pine from blister rust. In all, the School of Forestry, has cooperated in blister rust control work during the field season of 1923 to the extent of approximately $3100.

The Department of Plant Pathology of the University of Idaho, Agricultural Experiment Station, is examining all specimen suspected of being infected with white pine blister rust and is keeping the necessary records of such collections. The Extension Division is using its regular employees in so far as their duties permit, in locating cultivated black currants and other infected or potentially infected blister rust host plants and in giving publicity to the campaign to eradicate black currants and to other means for preventing the introduction and spread of white pine blister rust in Idaho.

The North Idaho Forestry Association, the Potlatch Timber Protective Association, the Clearwater Timber Protective Association, the Coeur d'Alene Timber Protective Association, the Pend O'Reille and the Priest Lake Timber Protective Association have used their regular employees in so far as their other duties permitted in systematically locating cultivated black currants, scouting for the disease, and collecting data on the distribution of wild currants and gooseberries. This work aggregated a total expenditure on the part of the North Idaho Forestry Association and its constituent associations of approximately $11,500.

The Office of White Pine Blister Rust Control, U. S. Department of Agriculture, paid the salaries and expenses of six field men engaged in the black currant eradication work during the field season of 1923. It is cooperating with the Idaho State Department of Agriculture in the strict enforcement of State and Federal Blister Rust quarantine now in effect. In addition, the office of White Pine Blister Rust Control, has made during the past year, extensive Ribes surveys and has obtained cost data on control measures which will eventually have to be practiced in Idaho.

The State of Idaho feels no little gratitude for whole hearted cooperation and help which it has always received from the Office of White Pine Blister Rust Control in combating the most serious menace which confronts the lumber industry in the Inland Empire today.

Surely no one can accuse any existing state agency of not doing its part in the control of this serious disease of white pine. We fully realize the stupendous proportion of our task, the difficulties which will undoubtedly be encountered, the discouragements, but we enter into it with the firm resolve that the lumber industry must be perpetuated in North Idaho. We, however, need the help and cooperation of the State of Washington. May we count on it?

Scouting for the Disease

During the course of the cultivated black currant eradication work, a constant effort was made to find the disease in Idaho, by careful inspection of wild and cultivated white pines, currants and gooseberries. No infections were found in the course of this work. But inasmuch as several new infections were found later in the season in southeastern British Columbia and northern Washington, it was considered advisable to carry on some intensive scouting during October when conditions were most favorable for finding the disease. A crew of two men was put into the field, who carefully scouted the drainages of the Kootenay and Moyie Rivers, in Boundary and Bonner Counties, of northern Idaho. 19 cultivated black currants, 620 cultivated red currants and gooseberries, and 745 wild Ribes were inspected. No infection was found in the course of this work.

Montana

Blister rust work in Montana, under Project 2, consisted of (1) eradication of cultivated black currants, (2) educational work, and (3) scouting for the disease. This work was carried on under the direct supervision of Mr. C. H. Johnson of this office. The Montana State Department of Agriculture has furnished Mr. Johnson with office space and facilities, at Missoula. As additional cooperation, Mr. W. L. Shovell, Chief of the Division of Horticulture of the Montana State Department of Agriculture, has given extensive assistance to the blister rust work.

Blister rust work in Montana has been carried on under the terms of the following cooperative agreement:

> MEMORANDUM OF UNDERSTANDING BETWEEN THE MONTANA STATE DEPARTMENT OF AGRICULTURE AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE, RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN MONTANA.
>
> EFFECTIVE MAY 1st, 1923 to JUNE 30th, 1924.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication or effective control of white pine blister rust in Montana in view of the threatened destruction of private, state and nationally owned timber throughout the West as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by natural dissemination or quarantine violations.

It is agreed that the Montana State Department of Agriculture and the Bureau of Plant Industry shall cooperate to the above ends in accordance with the following plans:

1. The Bureau of Plant Industry shall pay the salaries and expenses of one or more men who shall perform necessary scouting for the disease in Montana. The Montana State Department of Agriculture shall deputize these scouts to enable them to enter and inspect any property but not to destroy plants.

2. In view of the fact that the Montana State Department of Agriculture has no special appropriation for blister rust control, it is understood that when this disease appears in Montana, the Montana State Department of Agriculture agrees immediately to make every effort to secure funds for its eradication from sources available to it, and in the event of failure to secure necessary funds for this purpose, the Montana State Department of Agriculture shall deputize the employees of the Bureau of Plant Industry working in Montana, empowering them to destroy blister rust host plants infected or potentially infected with this disease.

3. The Montana State Department of Agriculture, and the Bureau of Plant Industry shall cooperate with the Federal Horticultural Board in the strict enforcement of State and Federal blister rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry shall pay the salaries and expenses and direct the work of one or more men who shall during the proper season inspect for violations of the Federal blister rust quarantines in the State of Montana. These men shall also cooperate with the Montana State Department of Agriculture in enforcing State quarantines. For this purpose they shall receive instructions in methods of procedure from the Montana State Department of Agriculture and shall be deputized to destroy plants shipped in violation of State quarantines.

4. The Montana State Department of Agriculture and its cooperators shall use their regular employees, so far as their other duties permit, in systematically locating cultivated black currants in infected or potentially infected blister rust host plants; in scouting for the blister rust; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. Such work will aggregate approximately 100 man days, representing a total expenditure on the part of the Montana State Department of Agriculture and its cooperators of about $500.00 for the control of this disease. The expenditures of the Bureau of Plant Industry, indicated in previous paragraphs will aggregate approximately $7,000.00 but none of the Federal funds shall be spent in compensation for plants destroyed in control work.

5. All official records showing work performed under this agreement shall be open to inspection of the Montana State Department of Agriculture or the Bureau of Plant Industry on request. All findings of the blister rust made by either the Montana State Department of Agriculture and its cooperators or the Bureau of Plant Industry shall be promptly reported to the other party. All specimens collected or received by the Montana State Department of Agriculture and its cooperators which are suspected to be infected with blister rust shall be submitted to the Bureau of Plant Industry for critical determination. The Bureau of Plant Industry shall give such technical information to the employees of the Montana State Department of Agriculture and its cooperators as will enable them to recognize the several stages of the disease.

6. It is understood that the Bureau of Plant Industry shall be primarily responsible for scouting and location of the blister rust in Montana and for technical information on its control, but that the Federal

government has no authority to destroy private or state property and therefore the Montana State Department of Agriculture shall be wholly responsible for the destruction of such pine, currant, and gooseberry plants as may be found necessary in order to control the spread of this disease in Montana, including plants shipped in violation of State and Federal blister rust quarantine regulations.

7. This memorandum of understanding shall take effect May 1st, 1923 and continue in force until June 30th, 1924, or until previously terminated by mutual consent of the parties concerned.

SIGNATURES:

(S) C. C. Davis
Commissioner of Agriculture, State of Montana.

(S) W. A. Taylor
Chief, Bureau of Plant Industry

Cultivated Black Currant Eradication

Cultivated black currant eradication work was started in Montana on May 1, with two two-man crews in the field. The crews continued work until August 15. Work was confined to the ten northwestern counties. The method used was to locate plantings of cultivated black currants, and then to ask the owners to remove their bushes. The efficiency of this work was greatly increased through a proclamation issued by Mr. C. C. Davis, Commissioner of Agriculture, State of Montana, which pointed out the menace to white pine from the cultivated black currants and urged the people to eradicate these bushes. This proclamation is as follows:

PERTAINING TO CULTIVATED BLACK CURRANTS

The following facts have been determined by the Commissioner of Agriculture:

The dangerous and injurious disease known as the white pine blister rust now exists in the western part of Washington and in the Province of British Columbia:

There is sufficient evidence that this disease may be introduced into the white pine forests of Montana:

It is definitely known that the cultivated black currant (Ribes nigrum and its varieties) is the most dangerous alternate host plant of this disease, and the occurrence of the plant in the State of Montana constitutes a direct menace to the white pine forests.

Recognizing the present and future importance of the lumber industry in Montana and the values at stake, leads me to believe that a situation now confronts us which is of interest to all and demands our immediate attention.

Now therefore, I, Chester C. Davis, Commissioner of Agriculture of the State of Montana, ask all growers of cultivated black currants to voluntarily destroy their bushes and discourage the future propagation of this plant in the State of Montana.

The following tabulation gives the results of this work:

Table 17

Status Cultivated Black Currant Eradication Work
Montana, November 30, 1923.

County	Eradicated		Not Eradicated		Total	
	Plantings	Plants	Plantings	Plants	Plantings	Plants
Missoula	81	524	15	449	96	973
Ravalli	99	703	7	164	106	867
Flathead	46	205	1	15	47	220
Lake	29	160	3	28	32	188
Mineral	8	39	-	-	8	39
Lincoln	16	121	-	-	16	121
Sanders	9	56	-	-	9	56
Silver Bow	14	44	3	17	17	61
Powell	6	25	1	48	7	73
Granite	-	-	1	3	1	3
Deer Lodge	1	2	-	-	1	2
Total	309	1,879	31	724	340	2,603

The cases in which plants have not as yet been eradicated are still pending. Further efforts are being made to secure their removal.

Educational Work

During the spring of 1923, a school campaign to locate cultivated black currants was carried on in Flathead, Lincoln, Sanders, Missoula, Ravalli, Silver Bow, Deer Lodge, Granite, Powell and Mineral Counties. Programs were sent to approximately 1050 teachers. Replies were received from about 50% of the teachers. Fifteen plantings of black currants, representing sixty-one bushes were located. Eleven specimens were sent in for examination.

The following statement from Mr. Johnson is of interest. "To my judgment the real value of a school campaign is the interest created among the younger generation, our future citizens, who must cope with the blister rust problems when they reach more serious dimensions. The school campaign is not without its good effects in the matter of securing the voluntary destruction of black currant bushes, especially when no law for their removal exists."

The following procedure was carried out:

1. Exhibits 1 to 4 were sent to the teacher with an enclosed addressed envelope for a reply.

2. When replies were received a post card was sent acknowledging the report - exhibit 5 A.

3. If no report was received in a reasonable time a post card reminder was sent - exhibit 5 B.

4. As a final effort to get the teacher to send in a report a second post card was sent - exhibit 5 C.

5. A letter was also sent to all the District School Boards calling their attention to the school campaign - exhibit 6.

6. When a report of a black currant planting was received a letter -exhibit 7 - the black currant proclamation of Mr. Davis, Commissioner of Agriculture - exhibit 8 - and a post card - exhibit 9 A - were sent direct to the owner urging him to destroy his black currants.

7. After due time if no reply had been received a reminder post card was sent - exhibit 9 B.

8. During a campaign the publicity department of the State Department of Agriculture aided the work greatly by issuing to the newspapers a series of articles regarding Blister Rust, the black currant etc.-exhibit 10-16.

Scouting for the Disease

The scouting for the disease which was carried on during the cultivated black currant eradication did not result in the location of any infections. During October, one man carried on intensive scouting for the disease in northwestern Montana in the drainages of the Kootenay, Yaak, Stillwater, and Flathead Rivers. During the course of this work, 334 cultivated black currants, and 1981 wild Ribes were inspected. No infection was found.

uperintendent of Public Instruction, State Department of Agriculture,
ureau of Plant Industry, U. S. Department of Agriculture, Cooperating.

Missoula, Montana
April 20, 1923

To The Teacher:

The white pine blister rust scouting program carried out during the fall of 1923 in the schools of Montana was very successful. I wish to extend appreciation for the keen interest shown by both teachers and students. We are glad to state that thus far the blister rust has not been found in the state.

Last summer the disease was found generally distributed in the coast region of British Columbia and at numerous places in western Washington. Outbreaks of the disease were also found at Revelstoke and Beaton, British Columbia. These points are only about one hundred miles north of the vast white pine stands in Idaho and Montana. The spread of the disease from this region threatens the vast inland white pine stands.

Every effort on our part must be made to stop its spread into the valuable timber stands of Montana. Past experience with this blister rust has proved that the CULTIVATED ENGLISH BLACK CURRANT is the most potent factor in establishing and spreading it in a community. This currant is generally of little commercial value in Montana and one of the most important steps to take in combating the disease is to locate all CULTIVATED BLACK CURRANTS, inspect them frequently and urge their eradication in every community. Eradication of CULTIVATED BLACK CURRANTS will retard the natural spread of blister rust.

In this important task both the teacher and the pupils can help in a very material and inexpensive way. Again we ask for your active cooperation and that of your students, in searching for CULTIVATED BLACK CURRANTS in the vicinity of their homes and in reporting to you any that they may find. Then if you will record the information reported by the students on the enclosed form and mail it in the addressed envelope provided, you will have aided greatly in this work. If no CULTIVATED BLACK CURRANTS are found please report this fact.

The students should be on the lookout for the disease also and report anything that looks suspicious. I am enclosing as a suggestion several methods which teachers have used in adapting this campaign to their regular work with the hope that they may be helpful to you in carrying out this program.

Thanking you for your past and future cooperation in this work, I am

Very truly your,

W. L. Shovell,

Collaborator.

Enclosures.

(COPY)

COOPERATIVE BLISTER RUST SCHOOL CAMPAIGN

State and County Superintendents of Montana, State Department of Agriculture and U. S. Department of Agriculture Cooperating.

LOCATION OF ENGLISH BLACK CURRANTS

Town_____County_____School District No._____Date_____

Teacher's Name_____Address_____No.Pupils_____Grade____

LIST OF BLACK CURRANT PLANTINGS FOUND

INSTRUCTIONS: Have each student report whether he has any black currants growing at his home. He should also determine by inquiry or examination whether his neighbors possess any black currants. If uncertain whether the currants are black, send in samples of the leaves with this report. See "Synopsis of Blister Rust" for description of methods of identifying the black currant

Name of student reporting	Name and address of owner of black currants	No.Bushes

SYNOPSIS OF BLISTER RUST IN THE WEST.

Pine attacked: This disease is one which attacks only the white (5-needled) pines. The 5-needled pines in the West are the western white pine, the sugar pine, the white barked pine and the limber pine.

The Disease: It is a parasitic plant that obtains all of its food from another plant. It is not an insect. It grows under the bark of the pine and thus eventually kills it. The disease spends part of its life on the pine and part on the leaves of the currants and gooseberries. To complete its life growth it must go from currant to white pine and back to currant. It cannot spread from pine to pine direct. It can spread from currant or gooseberry to currant or gooseberry.

Distribution of the Disease in the West: The disease besides occuring in the East is quite generally distributed in all the coast region of British Columbia and Washington. Also a heavy infection area occurs at Revelstoke and Beaton, British Columbia. These points are about one hundred miles north of the pine stands of Idaho and Montana. Scouting during the year 1922 failed to reveal the disease in any other localities in the Northwest.

Damage: In some areas in British Columbia the disease is epidemic. In one area near Daisy Lake, British Columbia, where the disease has been for about ten years 40% of the trees are now dead and in ten years probably over 90% will be dead. As illustrated in this area, the blister rust is a formidable enemy to the western white pine and promises to become one of the chief factors in the future timber production of this species.

Importance of the CULTIVATED ENGLISH BLACK CURRANTS: Past experience with this disease has well established the importance of the CULTIVATED BLACK CURRANT, also called the English Black Currant. This currant is many times more susceptible to blister rust and develops the disease more rapidly and abundantly than any other currants or gooseberries. Consequently it spreads the disease more rapidly and much further. New infections of blister rust generally get started around a planting of CULTIVATED BLACK CURRANTS and then spread to other wild and cultivated currant and gooseberry bushes throughout the region.

What is to be done: Regulations have been passed forbidding the shipment of currant, gooseberry or white pine plants out of the infected areas. The next most necessary measure to take is to locate and inspect all plantings of CULTIVATED BLACK CURRANTS and at the same time urge their owners to destroy them. The inspection of the plants will determine whether the disease is already present. Their eradication will delay the natural spread of the disease as well as reduce very greatly the possiblity of the future establishment of the disease in that community. The general public is asked to help, can help and should help in this work.

IT COSTS LESS TO KEEP BLISTER RUST OUT THAN TO COMBAT IT AFTER IT IS INTRODUCED.

How to tell the CULTIVATED ENGLISH BLACK CURRANT from other currants: This currant has a very distinct odor which is evident when a portion of a twig or leaf is crushed. Other cultivated currants and gooseberries do not have strong odors. Also on the under side of the leaves of CULTIVATED BLACK CURRANTS are small, yellowish dots visible to the naked eye, which are uniformly distributed.

METHODS SUGGESTED FOR PRESENTING THE BLISTER RUST PROGRAM TO THE STUDENT.

The following methods of adapting the Blister Rust Control School Campaign to the regular school program were used by some teachers in the fall campaign.

1. As an exercise in writing the students may be required to write a paragraph on the white pine blister rust after the teacher has read the "Synopsis of Blister Rust" to them. They could then go out looking for cultivated black currant plantings and be able to explain why they were looking for them.

2. As a letter writing exercise, the student after searching for cultivated black currants may write his report in the form of a business letter addressed to the U. S. Department of Agriculture. The results in these letters could be tabulated by the teacher or the letters sent in direct as a report.

3. Botany classes may be required to collect leaves and stems of cultivated black currants as a study in buds and leaves of plants.

4. Agricultural classes and general science classes may use the subject of blister rust for a discussion of how diseases effect the economic values of crops. Then the student could be asked to help in this particular problem by locating the cultivated black currants in his community.

5. The study of pine trees and cultivated black currants as well as other currants and gooseberries can be made the basis for spring field trips.

6. Competition between divisions of a class, different classes or different grades over a period of a week as to which group can find the most plantings of cultivated black currants may be used effectively to develop the interest of students.

A.

Statement on post card acknowledging report:

Missoula, Montana.

Your report on the survey for CULTIVATED BLACK CURRANTS in your community has been received. I wish to thank you for the public spirit you have shown by cooperating in this important work. Further I hope you will continue your cooperation by explaining the white pine blister rust to all with whom you come in contact. During the summer I hope you will keep the white pine blister rust in mind and if you find any suspicious specimens, send them in for examination.

Very truly yours,

W. L. SHOVELL,

Collaborator.

B.

First post card reminder:

Missoula, Montana.

Your report on the survey for CULTIVATED BLACK CURRANTS in your community has not yet been received. We wish to urge you to carry out the survey if possible and send us as complete information as you can. Due to the fact that your school work is nearing completion you may feel that you do not have time to carry on this survey. However, the situation is so serious that we wish at this time to impress upon you our very earnest desire for your cooperation.

Help make the survey complete. I hope we may have a report from you.

Very truly yours,

W. L. SHOVELL,

Collaborator.

C.

Second post card reminder:

Missoula, Montana

We are disappointed that we have not yet received a report from you on the survey for Cultivated Black Currants. White pine blister rust is so near that all must do whatever part they can to stop its spread and distribution.

We still hope that we may have a report from you.

Very truly yours,

W. L. SHOVELL,

Collaborator

Exhibit 6.

COOPERATIVE BLISTER RUST CONTROL

Superintendent of Public Instruction, State Department of Agriculture, Bureau of Plant Industry, U.S. Department of Agriculture, Cooperating.

Missoula, Montana,

April 20, 1923.

To The District School Board:-

At this time I wish to call your attention to the white pine blister rust school campaign that is being carried on in the schools during the fourth week of April. The campaign is being carried out in all the counties in Montana where there are white pine forests.

For your information I am enclosing a set of the program that is being sent to the teachers in your district. The matter has been discussed with both the state and county school superintendents and has their hearty approval.

It is felt that this is a worthy cause in which the teachers and children can be of real public service. If you can see fit to give your approval of this campaign and encourage the teachers in your district to carry out the program, your cooperation will be greatly appreciated. Any other action that you may take to help in combating this pest which all private lumber agencies, state officials and organizations of the U, S. Department of Agriculture are fighting, will exemplify your good citizenship.

Thanking you for any interest or active measures you may take in regard to this matter, I am

Very truly yours,

W. L. SHOVELL,

Collaborator.

Enclosures. (Copy)

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Blister Rust Control

Dear Sir:-

We have been informed through our representatives that you have cultivated black currant bushes on your premises. You have undoubtedly heard of the white pine blister rust which was recently discovered in the Puget Sound region, and also how important a part the cultivated black currants play in the spread of this disease. I am enclosing a copy of the United States Department of Agriculture Circular which explains in detail the history and spread of the disease.

Montana has at present approximately 855 million board feet of white pine which represents a stumpage value of four and one quarter million dollars. Western white pine has always been recognized as the leading lumber producing tree of the West. Its strength, durability, and fine working qualities have met with favor in the building and manufacturing industries everywhere.

Western white pine is the most desirable tree in Montana and is being used by the U. S. Forest Service for planting to insure us of a future timber supply in this state.

The white pine blister rust is in western Washington and British Columbia and also in the region about Revelstoke, B.C. Under present conditions it may be only a question of time before it becomes established in Montana. Our white pine forests constitute a great source of wealth and must be protected to the limit. We ask your help and this can best be extended at this time by digging up your cultivated black currants.

Will you dig up and destroy your cultivated black currant bushes to aid us in controlling the spread of this destructive disease. Your cooperation will be greatly appreciated by the Montana Department of Agriculture and the United Stated Department of Agriculture who are doing everything to prevent the spread of this disease.

After digging up your cultivated black currants please fill out and mail the enclosed, addressed post card. No postage is necessary.

Thanking you for your active interest and cooperation, I remain,

Very truly yours,

W. L. Shovell,
Collaborator.

PERTAINING TO CULTIVATED BLACK CURRANTS

The following facts have been determined by the Commissioner of Agriculture:

The dangerous and injurious disease known as the white pine blister rust now exists in the western part of Washington and in the Province of British Columbia;

There is sufficient evidence that this disease may be introduced into the white pine forests of Montana;

It is definitely known that the cultivated black currant (Ribes nigrum and its varieties) is the most dangerous alternate hose plant of this disease, and the occurrence of the plant in the State of Montana constitutes a direct menace to the white pine forests.

Recognizing the present and future importance of the lumber industry in Montana and the values at stake, leads me to believe that a situation now confronts us which is of interest to all and demands our immediate attention.

Now therefore, I, Chester C. Davis, Commissioner of Agriculture of the State of Montana, ask all growers of cultivated black currants to voluntarily destroy their bushes and discourage the future propagation of this plant in the State of Montana.

A.

Copy of post card to be filled out and returned when the owner of a planting of black currants had destroyed them.

W. L. Shovell, Collaborator,
Missoula, Montana.

Dear Sir:-

This is to inform you that on_____1923
I dug up and destroyed_____Cultivated black currant bushes
which is the total number I had on my premises, to assist in the
control of the white pine blister rust.

Signed_____

B.

Copy of reminder post card sent out:

DESTROY CULTIVATED BLACK CURRANTS and PREVENT BLISTER RUST

Up to this time we have not received the card from you stating that you have destroyed your cultivated black currant bushes. The season for the active spread of the white pine blister rust on cultivated black currants is rapidly approaching and it is urgent that these bushes be destroyed at once in order that the blister rust may be prevented from becoming established in the State. Please report the date when you destroyed the bushes.

Yours very truly,

W. L. Shovell,

Collaborator

Exhibit 10.

SENT BY THE DIVISION OF PUBLICITY OF THE MONTANA DEPARTMENT OF AGRICULTURE --- FOR RELEASE UPON RECEIPT

Through the cooperation of the school children of Western Montana, good progress is being made in the campaign for the elimination of the white pine blister rust. This is the first campaign probably to be launched in time to save the stands of timber that are threatened by the disease. Incidentally, it is also the last opportunity for such work, as the white pine timber of Montana, with that in Idaho, Washington and Oregon, comprises the only large body of its kind in the world.

The school children have located a number of plantings of cultivated black currents, whose presence constitutes a serious obstacle to any possible plan for delaying the spread of white pine blister rust, and for the protection of white pine after the disease is established in any region. The plant, according to pathologists of the federal bureau of Plant Industry, is capable of becoming infected at long distances from infected white pines and of spreading this infection to other white pines over greater distances than any other species of currant. It is considered by far the most dangerous secondary host plant of the disease, and as such constitutes a menace to the great national asset of white pine far out of proportion to its small commercial value.

The federal bureau of plant industry now has four men at work in the western field, who are also engaged in the location of cultivated black currants. It is hoped by August to locate all black currants west of the continental divide, and steps will then be taken to secure the eradication of as many of them as possible.

SENT BY THE DIVISION OF PUBLICITY OF THE STATE DEPARTMENT OF AGRICULTURE FOR RELEASE UPON RECEIPT.

The help of the school children of western Montana has been enlisted in a campaign launched this week to save from extinction the white pine forests in this state, which, with those of Idaho Washington and Oregon constitute the largest body of white pine timber in the world.

Blister rust, which destroyed the white pine forests of Europe, and already so seriously infected those of the eastern states as to make eradication impossible, has been discovered at numerous places in western Washington and in British Columbia some of which are only about a hundred miles from the vast white pine stands of Montana and Idaho.

While Federal and State quarantines have been established forbidding shipments of certain bushes and trees out of the diseased areas, the aid of the school children has been enrolled to stop the spread of the disease through locating for destruction all cultivated black currants in the white pine districts.

A peculiarity of the disease is that it can attack the white pine only after the fungus has grown on the leaves of wild or cultivated currant or gooseberry bushes. The cultivated black currant is the most susceptible, so the children have been requested by the cooperative Blister Rust Control agencies -- the state and county school departments, the state department of agriculture, and the U. S. Department of Agriculture -- to determine if any black currants are grown at their home or the homes of their neighbors, and if found, to give the name and address of the owner and the number of bushes.

If the black currants are destroyed, the wild currant and gooseberry bushes will not be infected to distribute the disease in the white pine timber, which is three or four times as valuable as any other species in the state.

The cultivated English black currant is easily identified by the distinct odor which is evident when a portion of a twig or leaf is crushed. Other cultivated currants and gooseberries do not have strong odors. Also on the under side of the leaves of cultivated black currants are small, yellowish dots visible to the naked eye, which are uniformly distributed.

SENT BY THE DIVISION OF PUBLICITY OF THE STATE DEPARTMENT OF AGRICULTURE -- FOR RELEASE UPON RECEIPT.

The campaign now being waged in western Montana as well as other parts of the west by the school children who are cooperating with the blister rust control agencies, if successful, in all probability will save them many a dollar when they are grown. The direct benefits of a successful campaign to eliminate the black currant and other host carriers of the blister rust, will accrue to the communities where stands of white pine now exist as these stands will then be logged-off and marketed; the indirect benefits will accrue in subsequent years to users of white pine. If the stands of white pine are further depleted by the ravages of the blister rust the supply, which at present is bigger than the demand, will be lessened still more, and the price to consumers will correspondingly increase.

For some uses, white pine is desired above all other kinds of wood. It is especially desirable for interior work and for the wood parts of farm equipment such as hoppers, sieve frames, parts of screens, boxes, drawers, seed holders, tool carriers and many other parts of farming mills, reapers, drills, tedders, threshing machines, corn shellers and separators.

The children who are now assisting in locating for destruction black currant and other disease hosts of the blister rust, thereby preventing the spread of this disease will reap the benefits when as men and women they become home owners of farm equipment.

SENT BY THE DIVISION OF PUBLICITY OF THE STATE DEPARTMENT OF AGRICULTURE -- FOR RELEASE UPON RECEIPT.

School children of western Montana who are aiding the cooperative blister rust control work by locating the black currant bushes through which the blister rust infection is transmitted to white pine timber, are engaged in a work of tremendous economic importance. If all the black currant bushes in the white pine regions are destroyed, the blister rust invasion which has already extended within one hundred miles of the white pine stands of western Montana, will be checked. Then, instead of being a dead loss, thousands of feet of timber will go through the logging camps and the mills, and for every thousand feet made into lumber from $13 to $16 will be expended in payrolls and supplies.

About one third of all the western white pine timber in the United States is found in western Montana forests. It is not only the most valuable species in the state, but in many districts it is only the presence of the white pine that makes it possible to profitably log mixed stands. The monetary value of the white pine is so much greater than that of the other species that it will sometimes pay to log a mixed stand where it would not pay to log the other species alone. It is a good deal like a mine with a body of low grade ore that contains one small rich streak. Without the rich streak, the low grade ore would not pay; with it, a profit can be obtained.

If the white pine timber is saved in Montana, thousands of acres of timber lands will be logged and hundreds of communities benefitted by the money expended in lumbering operations. If the blister rust is not checked, through extermination of the black currant bushes, logging operations on many mixed stands will never be done.

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SENT BY THE DIVISION OF PUBLICITY OF THE MONTANA DEPARTMENT OF AGRICULTURE -FOR RELEASE UPON RECEIPT.

A total of 104 locations of black currant bushes have been made in western Montana counties up to the present time in the campaign now being waged, with the help of the school children, against the white pine blister rust. This disease can attack the white pine only after the fungus has grown on the leaves of wild or cultivated currants or gooseberry bushes and plant pathologists assert that if these secondary host carriers are located and then dug up, this disease, which destroyed the white pine forests of Europe, of the Atlantic coast states and the Lake states and has appeared in the forests of British Columbia, will be checked.

In Missoula county 42 plantings of black currants have been located, in Flathead county 37 plantings, in Ravalli county 11 plantings, in Lake county 11 plantings and in Lincoln county 3 plantings.

The individual plantings are small, averaging about five bushes, and the degree of cultivation indicates that bushes are not grown for the fruit. In many cases the present owners do not know where the bushes originated from and are not responsible for their presence.

While owners of black currant bushes have not yet been asked to remove their bushes, the blister rust control agencies appreciate the voluntary action of some of the growers in doing so. Two of the largest plantings in the state were found in Missoula county, one containing 75 bushes and the other 27 bushes. Realizing the menace to the white pine timber stands in that region and to lumbering operations, the owners, without being solicited, destroyed them.

SENT BY THE DIVISION OF PUBLICITY OF THE MONTANA DEPARTMENT OF AGRICULTURE -FOR RELEASE UPON RECEIPT

Whether four and a quarter million dollars' worth (stumpage value) of white pine timber in Montana shall be destroyed by the white pine blister rust or conserved for use in the building and manufacturing industries, with the attendant logging and lumbering payrolls created in the western part of the state, largely depends upon the public spiritedness of a few Montana citizens.

These few Montana citizens happen to be owners of black currant bushes which are the most menacing secondary host plants of the blister rust disease. If the black currant bushes remain, the white pine timber forests are doomed, say plant pathologists; if the currant bushes go, the stands of white pine are almost certain to escape the disease, which is now ravaging the British Columbia forests.

There is no law in Montana compelling the destruction of black currant bushes. The conservation of 855 million board feet of white pine rests upon the public spiritedness of the owners of the currant bushes.

Taking cognizance of the situation, Chester C. Davis, commissioner of the Montana Department of Agriculture, has issued an appeal to all growers of cultivated black currants voluntarily to destroy the bushes and to discourage propagation in the future of this plant. Owners of black currants are requested to make a gift of their black currant bushes, to the Montana Department of Agriculture, that they may be destroyed, in the interests of public welfare.

Pathologists of the United States Department of Agriculture, with the cooperation of western Montana school children, have about completed a survey of the location of all black currant bushes in the state

SENT BY THE DIVISION OF PUBLICITY OF THE STATE DEPARTMENT OF AGRICULTURE -- FOR RELEASE UPON RECEIPT

The black currant bush bears the same relation to the white pine blister rust which threatens western Montana timber stands, as the barberry bush does to wheat rust. There the parallel ends. The spores from the barberry infect a crop of wheat which only takes a season to grow, but if the spores from the black currant bush infect the western white pine--it's good-night for fifty years.

It will be good-night, too, to many merchants, communities and logging and lumbering payrolls, if the threatened invasion, now only 100 miles distant from the western Montana forests, is not permanently checked through eradication of the black currant and other bushes which act as hosts to the white pine blister rust.

The white pine blister rust control agencies, which, with the cooperation of western Montana school children, is locating for extermination all black currant bushes and other disease hosts, hope that every individual in the threatened districts will realize the gravity of the impending menace before it is too late.

"Too late" has so far been the verdict in every region where the white pine blister rust has appeared. The white pine timber stands of northern Europe were destroyed and European scientists sent word to America to guard against it in this country. The warning went unheeded until the disease was established beyond possibility of eradication in Atlantic Coast states. Warning was sent from those districts to the Lake states, but again action was taken too late to permit eradication. Only two years ago it was discovered in British Columbia and again apparently too late. Fortunately, although it has made its way across the line into Washington, it had there not made the same headway as in British Columbia. The campaign now under way in Montana is part of a general heroic effort toestablish a dead-line through which the disease cannot penetrate. Scientists assert the dead-line can be made effective through the eradication of all black currant bushes. Wild and cultivated currants and gooseberries can be infected, but they are less susceptible, and destruction at this time of the black currant bushes will prevent the infection of the other host plants.

Here's the cycle of the disease. Spores from white pine trees infected with blister rust are blown to the currants and gooseberries, particularly the black currant, where they germinate, and the following spring a different kind of spore develops on the host plants, which the wind blows to white pine trees. Here the spore develops into the white pine blister rust. The disease cannot go from white pine to white pine, but must go from white pine to currant or gooseberry bushes and then back to the white pine. Destruction of the host plants will prevent the spread of the disease.

Oregon

Work under Project 2 in Oregon has been carried on under the terms of the following cooperative agreement:

MEMORANDUM OF UNDERSTANDING BETWEEN THE OREGON STATE BOARD OF HORTICULTURE AND THE BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE RELATIVE TO COOPERATIVE WORK ON THE CONTROL OF WHITE PINE BLISTER RUST IN OREGON.

EFFECTIVE APRIL 1, 1924 to JUNE 30, 1924.

The object of this memorandum of understanding shall be to facilitate the prompt location and eradication or effective control of white pine blister rust in Oregon in view of the threatened destruction of private, state, and nationally owned timber throughout the West as a result of the presence of this disease in British Columbia and Washington, and the danger of its further spread by natural dissemination or quarantine violations.

It is agreed that the Oregon State Board of Horticulture and the Bureau of Plant Industry shall cooperate to the above ends in accordance with the following plan:

1. The Bureau of Plant Industry shall pay the salaries and expenses of one or more men who shall perform necessary scouting for the disease in Oregon. The Oregon State Board of Horticulture shall deputize these scouts to enable them to enter and inspect any property.

2. In view of the fact that the Oregon State Board of Horticulture has no special appropriation for blister rust control, the Bureau of Plant Industry shall pay the salaries and expenses (in accordance with the fiscal regulations of the United States Department of Agriculture) of one or more men who shall be deputized by and work under the authority and direction of the Oregon State Board of Horticulture to locate and secure the general destruction of cultivated black currant plants in Oregon. These men shall also destroy host plants diseased with or exposed to infection from white pine blister rust, as directed by the Oregon State Board of Horticulture.

3. The Oregon State Board of Horticulture and the Bureau of Plant Industry shall cooperate with the Federal Horticultural Board in the strict enforcement of State and Federal blister rust quarantines now in effect or which may be promulgated. The Bureau of Plant Industry shall pay the salaries and expenses and direct the work of one or more men who shall during the proper season inspect for violations of the Federal blister rust quarantines in the State of Oregon. These men shall also cooperate with the Oregon State Board of Horticulture in enforcing State quarantines. For this purpose they shall receive instructions in methods of procedure from the Oregon State Board of Horticulture and shall be deputized to destroy plants shipped in violation of State quarantines.

4. The Oregon State Board of Horticulture and its cooperators shall use their regular employees, so far as their other duties permit, in systematically locating and destroying cultivated black currants and infected or potentially infected blister rust host plants; in scouting for the blister rust; in inspecting nurseries for this disease and in enforcing State and Federal blister rust quarantines. Such work will aggregate approximately 2,650 man days, representing a total expenditure on the part of the Oregon State Board of Horticulture and its cooperators of about $9,275.00 for the control of this disease. The expenditures of the Bureau of Plant Industry indicated in previous paragraphs will aggregate approximately $6,600.00 but none of the Federal funds shall be spent in compensation for plants destroyed in control work.

5. All official records showing work performed under this agreement shall be open to inspection of the Oregon State Board of Horticulture or the Bureau of Plant Industry on request. All findings of the blister rust made by either the Oregon State Board of Horticulture and its cooperators or the Bureau of Plant Industry shall be promptly reported to the other party. All specimens collected or received by the Oregon State Board of Horticulture and its cooperators which are suspected to be infected with blister rust shall be submitted to the Bureau of Plant Industry for critical determination. The Bureau of Plant Industry shall give such technical information to the employees of the Oregon State Board of Horticulture and its cooperators as will enable them to recognize the several stages of the disease.

6. It is understood that the Bureau of Plant Industry shall be primarily responsible for scouting and location of the blister rust in Oregon and for technical information on its control, but that the Federal Government has no authority to destroy private or state property and therefore the Oregon State Board of Horticulture shall be wholly responsible for the destruction of such pine, currant and gooseberry plants as may be found necessary in order to control the spread of this disease in Oregon, including plants shipped in violation of State and Federal blister rust quarantine regulations.

7. This memorandum of understanding shall take effect April 1, 1923 and continue in force until June 30, 1924, or until previously terminated by mutual consent of the parties concerned.

(S) Chas. A. Park
President, Oregon State Board of Horticulture.

******

This work has been carried on under the direct supervision of Mr. L. N. Goodding, of this office. Mr. Goodding is located at Corvallis, Oregon, where the Oregon Agricultural College has provided him with numerous facilities. Professor H. P. Barss has given Mr. Goodding a great deal of directive aid in formulating and carrying out the blister rust program.

Cultivated Black Currant Eradication

Cultivated Black currant eradication was carried on in Oregon with two two-man crews from May 1 to August 15. This work has been conducted in the twelve northwestern counties under authority provided by state law, passed by the last session of the State Legislature, providing for the destruction of the cultivated black currant as a public nuisance. The results of this work are as follows:

Table 18

Status of Cultivated Black Currant Eradication Work
Oregon, November 30, 1923

Counties	Eradicated		Not Eradicated		Total	
	Plantings	Plants	Plantings	Plants	Plantings	Plants
Benton	4	23	2#	1#	6	27
Clackamas	152	5,021	1*	12*	153	5,033
Clatsop	243	1,475	1*	63*	244	1,538
Columbia	60	303			60	303
Hood River	16	59			16	59
Lane	5	18	14#	63#	19	81
Marion	21	1,314	1#	12#	22	1,326
Multnomah	515	7,324			515	7,324
Polk	6	18			6	18
Tillamook	17	403			17	403
Washington	156	13,634			156	13,634
Yamhill	31	643			31	643
Total	1,226	30,235	19	154	1,245	30,389

These do not constitute refusals. Work in these counties is incomplete.
* Cases either not reported or pending court action.

Scouting for the Disease

Scouting for the disease was carried on both in conjunction with the cultivated black currant eradication and later in the season. This work in northwestern Oregon failed to reveal the presence of the disease in Oregon. In scouting for the disease considerable assistance was given by the Oregon State Board of Forestry. Through instructions issued to the field employees of this organization by Mr. E. A. Elliott, State Forester, a large number of mountainous areas were scouted for the disease. In addition to the actual scouting these men supplied the Blister Rust Control Office with information regarding the occurrence and distribution of native white pines and Ribes.

Nursery Inspection

During the course of the field season, thirty-eight nurseries were inspected in Oregon. As a result of this work, 18,908 cultivated black currants were eradicated from these nurseries. There are now no nurseries in Oregon known to possess cultivated black currants. The nurseries of western Oregon have all been inspected twice in the course of the present field season.

Educational Work

The following publicity campaign has been carried out in Oregon during the season of 1923.

1. School campaigns in spring.

   A. During the spring of 1923, a school campaign was carried out in Clatsop, Columbia, Multnomah, Hood River, Clackamas, Washington, Yamhill and Tillamook counties.

      1. Object (a) to locate cultivated black currants.
         (b) acquaint the public with Blister Rust.
      2. The following literature was sent out to each of the 2600 teachers.

         (a) Letter to teacher - Exhibit 1.
         (b) What the school children can do - Exhibit 2.
         (c) Synopsis of Blister Rust - Exhibit 3.
         (d) Suggestive methods to teachers - Exhibit 4.
         (e) Three specimen envelopes 3½" x 6½" with form to fill in - Exhibit 5 A.
         (f) Note to teacher on slip of paper 2½" x 5" - Exhibit 5 B.

      3. Results:

         225 authentic records of black currant plantings were obtained. 95 specimens were sent in for examination. Talks were made in the schools wherever convenient. As a result of these talks and talks with individual students it was revealed that the subject matter of the campaign had been presented in practically all cases.

2. Cooperation in Black currant campaign.

   A. The cooperation of the extension division of Oregon Agricultural College during the black currant campaign was solicited - Exhibit 6. The director sent out 23 letters to county agents and club leaders.
   B. The Oregon State Board of Horticulture used all of its inspectors in cooperating in the black currant campaign - Exhibit 7, 8. 26 of each of these letters were sent out.

C. The Oregon State Forestry Department instructed their personnel regarding the work and they were provided with forms upon which they could report information - Exhibit 9, 10. 320 of each of these letters were sent out to fire wardens.

3. Eradication of black currants by correspondence.

A. As each black currant location report was received letters were sent to the owner explaining the situation - Exhibit 11 - giving the details of the blister rust disease- Exhibit 12 - copy of the state law- Exhibit 13 - and a map showing the distribution of the disease - Exhibit 14 - as well as a post card for the owner to return stating that he had destroyed his black currants - Exhibit 15 A. About 800 of this set of letters were sent out to black currant owners. As a result 17,500 black currants out of 30,000 were destroyed.

B. If after due time no report was received from a black currant owner in response to the letter sent to him urging him to destroy his black currants a reminder post card was sent out - Exhibit 15 B.

4. Fall school campaign.

A. During the fall and winter a school campaign has been carried out over the entire state among about 6,800 teachers.

1. Object: (a) To educate the public regarding blister rust.
(b) To locate cultivated black currants.
(c) To scout for the disease.

2. The following literature was sent to each teacher:

(a) Letter to the teacher - Exhibit 16.
(b) Suggestions for arousing interest among pupils by teacher - Exhibit 17.
(c) Questions and answers concerning blister rust Exhibit 12.
(d) Map showing distribution of blister rust - Exhibit 18.
(e) Three specimen envelopes with outline upon it to be filled in by teacher - Exhibit 19 A.
(f) With the specimen envelopes a small note to the teacher was sent - Exhibit 19 B.

3. Results: As the campaign is still in progress no definite report on results can be given. The general results from the school campaign is well summarized in the following Statement of Mr. Goodding: "The work with black currant

owners in inducing them to eradicate convinced me that the great merit of the school work lies in the general information it disseminates. I am satisfied that much of the newspaper publicity would have failed to reach the farmer and rancher if blister rust had not already been the subject of conversation in the homes. Something induced people to read, for black currant owners knowing nothing about the disease were exceedingly rare. In fact, other farmers not black currant owners, whom we had occasion to approach seemed to be well-informed."

5. Instruction in schools.

In order to put the educational work on a more permanent basis it is gradually being introduced into the curricula of the colleges, universities and science courses of the public schools. The Botany and Pathology classes of the Oregon Agricultural College have a well outlined exercise on Blister Rust - Exhibit 20.

COOPERATIVE BLISTER RUST CONTROL
Supt. Public Instruction, Oregon Agricultural College
Bureau of Plant Industry, U. S. Department of Agriculture.

Corvallis, Oregon
April 15, 1923.

To the Teacher:

The white pine blister rust school campaign carried out last fall resulted in a hearty response from the teachers and pupils of the state. Through their work and that of the government scouts we are confident that this very serious disease is not yet in our state. It has, however, been found just across the Columbia River in the State of Washington and is established there probably beyond hope of eradication.

Since the disease is so well established right at our very door we must put forth every effort to check its advance and prevent its entrance into the state. Past experience has proved that the most powerful means of establishing and spreading this disease is the cultivated black currant. We come once more to ask your cooperation. This time it is our purpose to locate all the cultivated black currants. All the state and federal as well as private agencies are cooperating in this blister rust campaign. You and your pupils can also help in a very material way. From your response last fall we feel certain of your assistance at this time.

We are asking you to again call the attention of your pupils to the disease. (See enclosed synopsis of the disease.) Ask them to search for black currants at their homes and get the permission of their neighbors to look over their garden patches. When they locate any cultivated black currant bushes have them collect from the planting a single leaf which you will enclose in one of the small envelopes which we are enclosing for that purpose. Please be certain that the exact address of the owner of the black currants is given on the envelope so that we may write directly to the owner in each case. More of the small envelopes will be sent promptly upon request.

After you have all the specimens from the pupils please place the small envelopes containing them into the large addressed envelope and mail.

We are not asking the pupils to look for the disease at this time of the year but we do wish to have them locate all the cultivated black currants in your district, if possible. The disease does not show up until later in the season.

Thanking you for your cooperation, I am,

Yours very truly,

H. P. Barss,
Collaborator

P. S. I am enclosing as a suggestion several methods which the teachers have used in adapting the school campaign to their regular work with the hope that they may be helpful to you in carrying out this campaign.

Exhibit 2.

COOPERATIVE BLISTER RUST CONTROL
Supt. of Public Instruction, Oregon Agricultural College
Bureau of Plant Industry, U.S. Department Agriculture

WHAT THE SCHOOL CHILDREN OF THE STATE OF OREGON CAN DO AT THE PRESENT TIME TO AID IN THE FIGHT TO KEEP THE WHITE PINE BLISTER RUST OUT OF THE STATE OF OREGON

First of all WHAT IS THE REAL SITUATION?

Oregon has $27,000,000 worth of western white and sugar pine which must be saved for the state and nation.

The white pine blister rust which is the most destructive and fatal disease known to attack pines has already made inroads into the forests of British Columbia and has been found as far south in the State of Washington as the southern tip of the Ilwaco Peninsula which is just across the mouth of the Columbia River from Oregon. It has not been found in Oregon and we must keep it out if possible.

This disease is harbored and spread more by the cultivated black currant than by any other means. Remember, also, the white pine blister rust in Oregon will make it impossible to grow white or sugar pine in the state for future generations without great and continued expense in eradicating all currants and gooseberries.

Now comes the part that you can do. Find all the cultivated black currants in your neighborhood and get us the addresses of the owners so that we can take the matter up with them to have the black currants dug up and destroyed. Here is a chance for you to do something well worth while for your state. You may help to save millions of dollars worth of the finest lumber trees in the world. White pines mean lumber, lumber means homes, employment, happiness and wealth to thousands.

We are counting on you,

H. P. BARSS,

Collaborator,

Exhibit 3.

SYNOPSIS OF BLISTER RUST

Pine attacked: This disease is one which attacks only the white (five-needled) pines. The five-needled pines in Oregon are the western white pine, the sugar pine, the white barked pine and the limber pine.

The disease: It is a parasitic plant that obtains all of its food from another plant. It is not an insect. It grows under the bark of the pine and thus eventually kills it. The disease spends part of its life on the pine and part on the leaves of currants and gooseberries. To complete its life growth it must go from currant to pine and back to currant. It cannot spread from pine to pine direct. It can spread from currant or gooseberry to currant or gooseberry.

Distribution of the disease in the West: The disease besides occurring in the East is quite generally distributed in British Columbia and all of the coast region of Washington from the Canadian line to the Columbia River. Scouting during the year of 1922 failed to reveal the disease in any other localities in the West. It is probably firmly established where it now exists.

Importance of the English black currant: Past experience with this disease has well established the importance of the English black currant. It is many more times susceptible to the disease, and develops the disease more rapidly and abundantly than other currants or gooseberries. Consequently it spreads the disease more rapidly and much further. New infections of blister rust are generally found centering around a planting of black currants.

What is to be done: In analyzing the foregoing situation the experts of the U. S. Department of Agriculture and of the different states have decided that an effort must be made to keep the disease where it now is by employing every means possible to hinder its natural or artificial spread. Regulations have been passed forbidding the shipment of currant, gooseberry or white pine plants, out of the infected area. The next most necessary measure to take is to locate and inspect all plantings of black currants and at the same time urge their owners to destroy them. The inspection of the plants will determine whether the disease is already present. Their eradication will delay the natural spread of the disease as well as reduce very greatly the possibility of the future establishment of the disease in that community. The general public is asked to help, can help, and should help in this work.

IT COSTS LESS TO KEEP IT OUT THAN IT WILL TO COMBAT IT WHEN ONCE INTRODUCED.

How to tell the English black currant: This currant has a very distinct skunk-like odor which is evident when near the plant or is evident if a portion of a twig or leaf is slightly crushed. Other currants and gooseberries have no definite odor. Also, on the under sides of the leaves are small yellowish minute spots visible to the naked eye. These are uniformly distributed over the leaf. It is from these yellowish spots that the peculiar odor originates. Further, the fruit is black.

Exhibit 4.

SUGGESTIVE METHODS OF PRESENTING THE BLISTER RUST PROGRAM TO THE STUDENT.

The following methods of adapting the Blister Rust Control School Campaign to the regular school program were used by teachers in the fall campaign. They are given as a suggestion to the busy teacher.

1. As an exercise in writing the student may be required to write a paragraph on the White Pine Blister Rust after the teacher has read the "Synopsis of Blister Rust" to them. They could then go out looking for black currant plantings and be able to explain why they were looking for them.

2. As a letter writing exercise, the student after searching for black currants may write his report in the form of a business letter addressed to the U. S. Department of Agriculture.

3. Botany classes may be required to collect leaves and stems of black currants as a study in buds and leaves of plants.

4. Agricultural classes and general science classes may use the subject of Blister Rust as an example for a discussion of how diseases effect the economic values of crops. Then the student could be asked to help in this particular problem by locating the black currants in his community.

5. In art study classes the teacher may have the students collect currant leaves, draw or paint them and then turn in the material to the teacher.

6. The study of pine trees and black currants as well as other currants and gooseberries can be made the basis for spring field trips.

7. Competition between divisions of a class, or different classes and of different grades over a period of a week as to which group can find the most plantings of black currants may be used effectively in this work.

Exhibit 5.

A. The following outline occurred on the outside of the specimen envelopes:

This envelope will constitute a location record of a cultivated black currant planting when the blanks are properly filled out and a black currant leaf from the planting is inserted.

Name of owner of cultivated black currants _____

City or Post Office _____

Street & No. or Rural Route & No. _____

No. of cultivated black currant bushes in planting _____ _____

Name of pupil reporting _____

Name of teacher _____

B. The following note on a piece of paper $2\frac{1}{2}$" x 5" was clipped to each set of specimen envelopes:

Note to the Teacher: It is not our thought that you shall distribute these envelopes to the pupils. The teacher can handle them more satisfactorily. The idea is to make each envelope used a record of a cultivated black currant planting. A single envelope should never contain the leaves from more than one planting. In case more envelopes are needed they will be sent promptly on request. If you think the specimen is diseased, write "diseased" on the face of the envelope.

After the pupils have all reported, the envelope can be enclosed in the large addressed envelope.

Exhibit 6.

Botany Department, O.A.C.
Corvallis, Oregon
April 4, 1923

Prof. Paul V. Maris
Director, Extension Service
Corvallis, Oregon

Dear Prof. Maris:

The state authorities and the U. S. Department of Agriculture are preparing to actively renew the fight to prevent the White Pine Blister Rust from entering the state of Oregon.

As you know the cultivated black currant, and other currants and the gooseberries constitute the alternate host for the disease. Of these, however, the black currant by reason of the fact that it is far more susceptible to the disease and produces spores in much greater abundance is much more dangerous than the others. In view of this fact the last legislature passed a law which met with the approval of the Governor declaring the black currants to be a nuisance.

Our opening campaign in Oregon for this season will be in the public schools in Hood River, Multnomah, Columbia, Clatsop, Tillamook, Yamhill, Washington, and Clackamas Counties, as these counties constitute what is thought to be the real danger zone or region where the disease is most likely to enter the state from its southern-most footing in the state of Washington. It will take place during the third week of April.

The purpose of the campaign will be especially to locate the black currants and at the same time educate the people about the disease.

It will be followed at once by a campaign to have all the black currants eradicated which have been located either by the school children or the government scouts.

We are bringing this matter to you at this time because we feel that you will wish to have your organization help in every way possible. A county agent can often not only remove a feeling of antagonism for such a measure as the eradication of a disease host but can even create enthusiasm in a community in having it carried out.

I am enclosing on a separate sheet a few pertinent facts about the White Pine Blister Rust.

Thanking you for your cooperation in this matter, I am,

Yours very truly,

H. P. Barss
Plant Pathologist, In charge of
Blister Rust Work for the State of
Oregon

OREGON STATE BOARD OF HORTICULTURE
Chas. A. Park
Commissioner for Second District
Salem, Oregon.

County Fruit Inspector,

Dear Sir:

During the past eighteen months, the Federal Government has cooperated with the State Government in conducting a campaign of control in regard to a disease known as the White Pine Blister Rust, which disease attacks the five-needle pines of our forests. The disease if not checked means the extermination of the valuable White Pine and Sugar Pine timber.

I wish to call your attention to one important feature of this disease, and that is it requires a currant or gooseberry bush to complete its life cycle. The easiest method of control is to eliminate the cultivated black currant bushes which are the most susceptible to this disease in the development of its life cycle.

To this end the last Legislature enacted a law against the growing or selling of the cultivated black currant.

The Department of Botany at the Oregon Agricultural College is working in cooperation with the Federal Department to control this disease. You will soon receive from this Department a letter giving full information concerning the subject. I ask that you give the same your careful attention.

Thanking you for your loyalty in this work, I am

Yours truly,

Chas. A. Park,

President,
Oregon State Board of Horticulture.

Exhibit 8.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY

Blister Rust Control

Botany Department O. A. C.,
Corvallis, Oregon.
September 17th, 1923.

Dear Sir:-

Mr. Chas. A. Park, President of the Oregon State Board of Horticulture, has already written you about your duties in locating and eradicating cultivated black currants. Here is a little fuel to fire your enthusiasm. To properly enforce a law we must have our hearts in it.

Please read the questions and answers about white pine blister rust. Every question is one you might ask or one the owner of black currants might ask. The answers are based on observations made by the U. S. Department of Agriculture. Look at the sketch map. It will give you an idea of what we are up against.

This campaign is not something new. The newspapers have told about the disease, the school children have heard about it and carried the information into the homes and cultivated black currant owners and government field men have already taken out over 30,000 cultivated black currant bushes in the State. But the work is not complete.

Your duties take you over many parts of the county and throw you in touch with many of the residents. You can not only locate and eradicate the cultivated black currants in your county and find the disease if it is present but in doing this you can give correct information to everybody not fully informed about the disease.

In addition to the above, which is the big part, may we ask you to send any material you suspect of being diseased with blister rust to the Corvallis office and give us the names and addresses of cultivated black currant owners who have destroyed their bushes in response to your request, or who have permitted you to do so. Also state the number of bushes and the date of eradication. The use of the blanks provided herewith will be helpful in this connection.

Send all specimens and data about cultivated black currant eradication to the Botany Department, Oregon Agricultural College, Corvallis, Ore.

Thanking you for your cooperation, I am

Very truly yours,

lng/ca

Junior pathologist.

UNITED STATED DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Botany Department,
Oregon Agricultural College,
Corvallis, Oregon.
August 13th, 1923.

Blister Rust Control

Dear Sir:-

After talking with Mr. Elliott and visiting some of the Fire Wardens in the field I have decided to write to all of the field men, outlining as briefly as possible the seriousness of the Blister Rust situation and the help they can give without interfering with their regular duties.

1st - White Pine Blister Rust is a very destructive disease of white pines. It cannot spread from a diseased pine to a healthy one but develops a necessary intermediate stage on the leaves of currants or gooseberries, either native or cultivated.

2nd - The disease is in western Washington from the Canadian boundary to the Columbia River.

3rd - The presence of white pines every few miles is apparently unnecessary to the spread of the disease. No white pines were found anywhere near Ilwaco, Pacific County, Washington. But at this place cultivated black currants were found heavily infected during the last season.

4th - The cultivated black currants harbor and spread the disease. They are far worse than any other currants and gooseberries in this respect.

5th - Oregon has had until recently many plantings of cultivated black currants. Doubtless many remain in isolated sections missed by our scouts.

6th - Oregon has $27,000,000 worth of white and sugar pine at stake, not to mention future possibilities from reproduction.

WHAT CAN THE FIRE WARDENS DO ABOUT IT?

1st - Keep an eagle eye open for the disease. Since it was found at Ilwaco last year it is not impossible that it is in Oregon now.

2nd - Locate the cultivated black currants in your territory, if possible induce the owners to eradicate them in compliance with the state law, and notify the Corvallis office of the action taken.

3rd - Report to the Corvallis office if white or sugar pines are to be found in your section and give if possible the exact location and the approximate quantity particularly of isolated stands.

4th - Send specimens of wild currants and gooseberries to the Corvallis office with data regarding the location, date of collection and name of the collector. If possible get specimens with berries. The Corvallis office will identify these specimens for you and they will constitute location records. We need information about the distribution of the native currants and gooseberries in planning our fight against the disease.

Send information and specimens to L. N. Goodding, Botany Department, Oregon Agricultural College, Corvallis, Oregon.

Thanking you for your cooperation, I am

Yours very truly,

/s/ Leslie N. Goodding
Junior Pathologist

LNG/ca

FIRE WARDEN'S REPORT
to
BLISTER RUST OFFICE, DEPT. OF BOTANY, OREGON AGRICULTURAL COLLEGE, CORVALLIS, OREGON

Are there any white pines; i.e., five-needled pines in your territory?_____

Isolated native trees_____Trees in cultivation_____

Scattering stands_____, Commercially important_____

Species. Eastern White Pine_____, Western White Pine_____

Sugar Pine_____, White Bark Pine_____.

Location: Here give exactly if possible.

Section	Township	Range	Nearest P.O.	Distance from P.O.	Direction from P. O.	Remarks

Are there any cultivated black currants in your territory?

Name of Owner	Post Office Address	No. of bushes	Has eradicated	Refused to eradicate	Remarks

Have you sent any material to the Corvallis Office you suspected of being diseased with blister rust?
Date of this report_____

_____
Fire Warden

P.O. Address_____

Exhibit 10.

Exhibit 11.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY

Blister Rust Control

Dear Sir:

Doubtless you have read in your local newspaper that the state authorities in cooperation with the U. S. Department of Agriculture are making an effort to protect the white and sugar pine forests of the State of Oregon. By a conservative estimate these forests are estimated to be worth $27,000,000.00.

Perhaps you know that the cultivated black currant is the most dangerous means of harboring and spreading this disease. If you are not familiar with this fact the enclosed pamphlet will explain to you the nature of the disease and the part played by the black currant.

The disease is now present in the State of Washington and has been found as far south as the Ilwaco Peninsula just across the mouth of the Columbia from Oregon. It is up to us to check its progress and if possible to keep it out of this state.

You will find enclosed a copy of the state law declaring the black currant to be a nuisance.

We are informed that you have one or more cultivated black currant bushes on your place, and we feel sure that after you understand the situation you will cooperate with the state and remove them at once for the season for the active spread of the disease is near.

In taking out your bushes please be sure that they are entirely uprooted and burned or hung on fences and trees until entirely dried out. Black currants are very tenacious of life and may again start to grow if there are exposed roots left in the ground or if the bushes are thrown into muddy places.

After destroying your bushes please fill out the enclosed card and mail it. It requires no postage. It will constitute a record of eradication and will assure us that your bushes have been removed.

Thanking you for your cooperation in this effort to protect one of our great state resources, I am

Yours very truly,

H. P. Barss
Collaborator

QUESTIONS AND ANSWERS CONCERNING THE DISEASE

WHITE PINE BLISTER RUST

1. Q. What is white pine blister rust?
   A. It is a plant parasite which attacks white pines and currants and gooseberries and is very destructive to white pines. It is very similar in nature to grain rust which attacks the barberry as well as the grain.

2. Q. How can we recognize it?
   A. A rust is so called because it resembles rust as that on iron. The stage first appearing on the currant or gooseberry leaves strikingly resembles small spots of rust on the under surface of the leaves. A later stage has the appearance of short hairs. It is always well to send leaves you think are diseased to the Botany Department, Oregon Agricultural College, Corvallis, Oregon. It is in a position to give you definite information. On white pines the rust makes its appearance as swellings on branches or the main stem or bole. These swellings crack open and orange colored spore bodies protrude. These are not only visible; they are conspicuous. From these spore bodies millions of spores are released which infect currants and gooseberries.

3. Q. Does this disease attack other plants?
   A. It attacks only the pines, currants and gooseberries.

4. Q. Does it do much damage?
   A. It kills white pines of all ages and its presence in a region makes it impossible to grow these trees.

5. Q. Can it be controlled?
   A. It can. It is only necessary to destroy all currants and gooseberries in regions where we wish to grow white pines. The disease never passes from pine to pine. It passes from pines to currants and gooseberries, from currants and gooseberries to other currants and gooseberries and finally from currants and gooseberries back to the pines.

6. Q. Has the disease been found in Oregon?
   A. It had not been found up to September 1, 1923, but it will not be surprising if someone finds it this season.

7. Q. Is it doing any damage except in the Northwest?
   A. It has already done great damage in the New England States and is costing thousands of dollars annually for local control there and in Wisconsin and Minnesota. The disease in Europe has made the commercial growing of white pine impossible.

8. Q. Where did the disease come from?
A. It was introduced into eastern United States from Europe some time before 1906 on nursery stock. The disease was introduced into British Columbia direct from Europe some years later.

9. Q. In what ways can I assist in controlling this disease?
A. a. Send specimens you suspect of being diseased to the Blister Rust Office, Botany Department, Oregon Agricultural College, Corvallis, Oregon.
b. Report to the same office information about any cultivated black currant plantings remaining in the State.
c. Becareful not to order plants in violation of the state or federal quarantines.

QUESTIONS AND ANSWERS ABOUT THE CULTIVATED BLACK CURRANT AND ITS RELATION TO WHITE PINE BLISTER RUST

1. Q. Why is the state eradicating the cultivated black currant and not all currants and gooseberries?
A. Blister rust spores coming from great distances will produce the disease on cultivated black currants when other currants and gooseberries fail to take it. Again it produces spores in vast abundance and spreads the disease to both pines and currants or gooseberries much greater distances than any other currants or gooseberries. Cultivated black currants are of little value to the state while white pines are of vast importance.

2. Q. Is there any law compelling owners of cultivated black currants to destroy them?
A. The last legislature passed a law forbidding the growing or sale of cultivated black currants.

3. Q. Are there many black currants in the state?
A. We believe most of them have been destroyed. About 30,000 were removed last fall and this summer.

4. Q. Were owners paid by the state or government for the bushes destroyed?
A. They were not. Practically all owners were willing and anxious to cooperate in protecting our white pine forests. Over 17,500 bushes were removed by owners and the remainder were destroyed by scouts with the permission of the owners. A very few remaining, less than 80 bushes, will require special action by the state.

5. Q. Are not the wild black currants as bad as the tame ones?

5. A. Extensive experiments and observations by the U. S. Department of Agriculture have shown that the cultivated black currant is much worse than the wild black one, which is a different kind.

6. Q. How can we recognize cultivated black currant bushes?
A. The leaves have a strong odor, umpleasant to most people. Their lower surfaces are dotted with minute glistening glands resembling beads. The fruits are black. The leaves are similar in shape and size to those of the cultivated red currants but the points are sharper.

7. Q. Will destroying the cultivated black currants keep the disease out of Oregon?
A. It is possible that their eradication may keep it out for some years. Should it finally gain an entrance the absence of black currants will slow up its advance very materially.

8. Q. If the eradication of our cultivated black currants will not keep the blister rust out of our pines permanently are we not throwing away a valuable fruit industry to no avail?
A. The cultivated black currant industry is of very little value to the State. If the disease can be checked until local control methods can be developed in white pine regions we will have gained many times the value of the cultivated black currants.

9. Q. Isn't this black currant eradication advocated by the lumbermen and are they not the ones to benefit by it?
A. The eradication of cultivated black currants is advocated primarily by the U. S. Department of Agriculture and the State Board of Horticulture. The timber owners should, of course, be interested in it as should all citizens of the State, but protection of the forests against fire and disease is not primarily work for the lumbermen, since the prosperity of the entire state and the nation is inseparably linked to the forests. Standing forests mean sustained yields of lumber for houses and barns and bridges, sustained employment and payrolls. Sustained payrolls mean sustained markets for butter and apples and shoes. Sustained forests mean sustained prosperity.

10. Q. In many parts of western Oregon there are no white pines for stretches of a hundred miles or more. What possible harm could a few patches of cultivated black currants do in such a region?
A. This can best be answered by an observation on what the disease has done. Western Washington is not unlike western Oregon in the scarcity of white pines. Government scouts were unable to locate white pine in Washington within fifty miles of Ilwaco but a very heavy infection was found there on cultivated black currants last fall. What has happened in Washington may happen in Oregon. Remember the disease will travel for many miles from pines to cultivated black currants. It will travel from currant to currant. The more cultivated black currants we have the faster the disease will travel.

QUESTIONS AND ANSWERS CONCERNING WHITE PINES

1. Q. Are white pines of commercial values?
   A. The most valuable standing timber in the west today is white pine and there are vast quantities of it.

2. Q. Do they occur in Oregon?
   A. There are two kinds of white pine of great commercial value in the state. These are the western white and sugar pines. A third occurs in the high mountains and is not commercially important. It is the so-called white bark pine.

3. Q. How may I know a white pine?
   A. It has five needles in a bundle. All pines with this character in the northwest are white pines.

4. Q. Where are the white pines in Oregon?
   A. A glance at the accompanying sketch map will give you an idea of their general distribution. Over much of this area they are very scattering tut they are of commercial importance along the Cascades and in Southern Oregon. Polk County also has some commercial white pine timber.

5. Q. What is the value of Oregon's white pine timber?
   A. A government estimate based on the value of the standing timber is $27,000,000 for the western white pine and sugar pines.

6. Q. Are there not other trees equally as valuable which can be used in reforestation and which are not subject to white pine blister rust?
   A. No. White pine holds a unique place in the lumber market. White pine lumber always commands a higher price because of its very superior qualtities. It also adapts itself to reforestation as it comes in readily after fires and lumbering operations and is a rapid growing tree.

Exhibit 13

Thirty-second Legislative Assembly--Regular Session

HOUSE BILL NO. 263

Introduced by MR. CRAMER (by request) and read first time January 29, 1923

A BILL

For an act to declare the cultivated black currant (ribes nigrum) and the common barberry (berberis vulgaris) and its varieties a public nuisance and providing for their eradication.

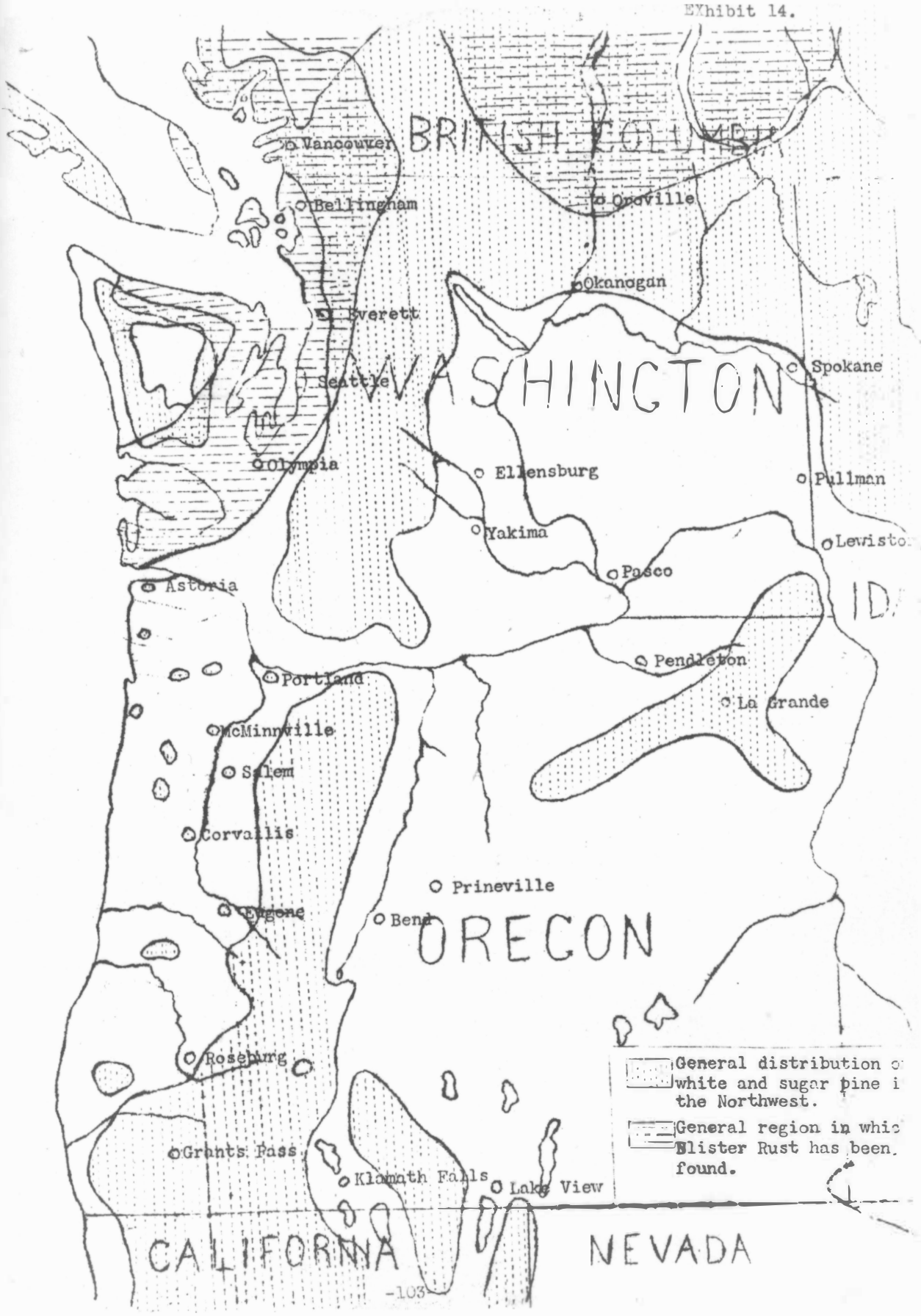
Be It Enacted by the People of the State of Oregon:

Section 1. The cultivated black currant (ribes nigrum), a most dangerous host plant of the white pine blister rust disease (cronartium ribicola) which disease seriously attacks the five-needle pines including western white pines and sugar pines native to Oregon, and the common barberry (berberis vulgaris) and its varieties, a dangerous host plant of the black stem rust of wheat and other cultivated grains and grasses (puccinia graminis) are by reason of their menace to valuable products of the soil in Oregon hereby declared to be a public nuisance, and the several commissioners of the state board of horticulture, the state inspector, or the county inspectors are hereby invested with the power to abate the nuisance in a summary manner.

Section 2. It shall be unlawful for any company, corporation, society, association, partnership or any individual or combination of individuals in the State of Oregon to grow, propagate or distribute cultivated black currants (ribes nigrum) or common barberries (berberis vulgaris) or varieties of the same.

Section 3. Any company, corporation, society, association, partnership or any individual or combination of individuals violating the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than one hundred dollars ($100).

Exhibit 14.



-103-

A. Release statement returned by black currant owner after he had destroyed his black currants.

Black Currant Eradication Record Card

H. P. Barss, Collaborator,
Corvallis, Oregon

Dear Sir:

This is to inform you that on_____1923 I dug up and destroyed_____cultivated black currant bushes which is the total number I had on my premises, to assist in the control of the white pine blister rust.

Signed_____
Address

B. Reminder post card sent to black currant owners:

Reminder Card

DESTROY BLACK CURRANTS and PREVENT BLISTER RUST

Up to this time we have not received the card from you stating that you have destroyed your cultivated black currant bushes. The season for the active spread of the white pine blister rust on black currants is rapidly approaching and it is urgent that these bushes be destroyed at once in order that the blister rust may be prevented from becoming established in the state. Please report the date when you destroyed the bushes.

Yours very truly,

H. P. Barss
Collaborator

COOPERATIVE BLISTER RUST CONTROL
Supt. of Public Instruction, Oregon Agricultural College,
Bureau of Plant Industry, U. S. Department of Agriculture

Corvallis, Oregon
October 22nd, 1923

To the Teacher:-

A Forest Service officer known throughout the Northwest, in speaking of our blister rust educational campaign, remarked that we had certainly put it across for every little boy and girl he met knew all about white pine blister rust. The credit for our success belongs to the teachers.

We must not, however, drop the matter here. There is still imminent danger from an invasion of blister rust. In fact the disease may be with us at this time. If it is we must find it. In spite of the good work done in locating the cultivated black currants and subsequently eradicating them there are still plantings of which we know nothing. It is of primary importance that we locate these.

You can help us very materially if you will again bring this matter to the attention of your pupils. In case you are a new teacher and have not heard of this campaign you can become familiar with it by reading the enclosed questions and answers about the disease and by studying the sketch map. In case you helped in previous campaigns these questions and the map will be even more interesting to you.

Let me briefly outline what we want.

First. Since the cultivated black currant is the most serious plant we have for harboring and spreading the disease we must locate all of these remaining in western Oregon. If a pupil locates a planting have him bring a leaf which you can place in one of the small envelopes. Then if you will fill out the blanks carefully and send the envelope to us we will do the rest.

Second. We must keep our eyes open for the disease. This is the season to look for it. That you may not look blindly let us suggest the following method to you. If the disease is in your locality it will be in evidence on the cultivated black currants, so if you find any of these search the under sides of the leaves very carefully. In case you find anything that looks suspicious do not rely too much on your own judgment. Place several leaves, in one of the small envelopes, fill out the blanks just the same and write across the face "diseased".

We will study it carefully and report to you if you have found the disease. You know we have the facilities for studying these things. In case you can find no cultivated black currants to examine the next most likely place to look for the disease is on the wild stink currant which grows along the densely shaded streams throughout western Oregon. If you can find neither of these examine other currants and gooseberries.

If you took part in our previous campaigns we wish to thank you. We got many records of black currant plantings. Whether this is your first season or whether you have served the state before we wish to thank you for the cooperation we are certain you will give us.

Very truly yours,

H. P. Barss
Collaborator

hpb/ca

Enclosures.

SUGGESTIONS FOR AROUSING INTEREST in WHITE PINE BLISTER RUST AMONG THE PUPILS

1. After the teacher has read the series of questions and answers about the cultivated black currants to the pupils they may be asked to write a short composition explaining the relation of the cultivated black currant to the blister rust and why these bushes should be destroyed.

2. Again the pupil may be asked to write a letter to a John Doe who is supposed to have cultivated black currants explaining to him why he should destroy his bushes.

3. Pupils in the geography classes may be asked to draw sketch maps of Oregon and Washington in which they show the general distribution of white pines and of the blister rust.

4. Brief business letters may be written by the pupils to the Botany Department, Oregon Agricultural College, Corvallis, Oregon, telling about the white pines either native or cultivated in the regions in which they live. If the pupils will enclose a bunch or two of the needles of the pines we will be very glad to receive such letters.

5. The more advanced classes may write letters to the Botany Department telling of the different kinds of wild currants and gooseberries in their sections.

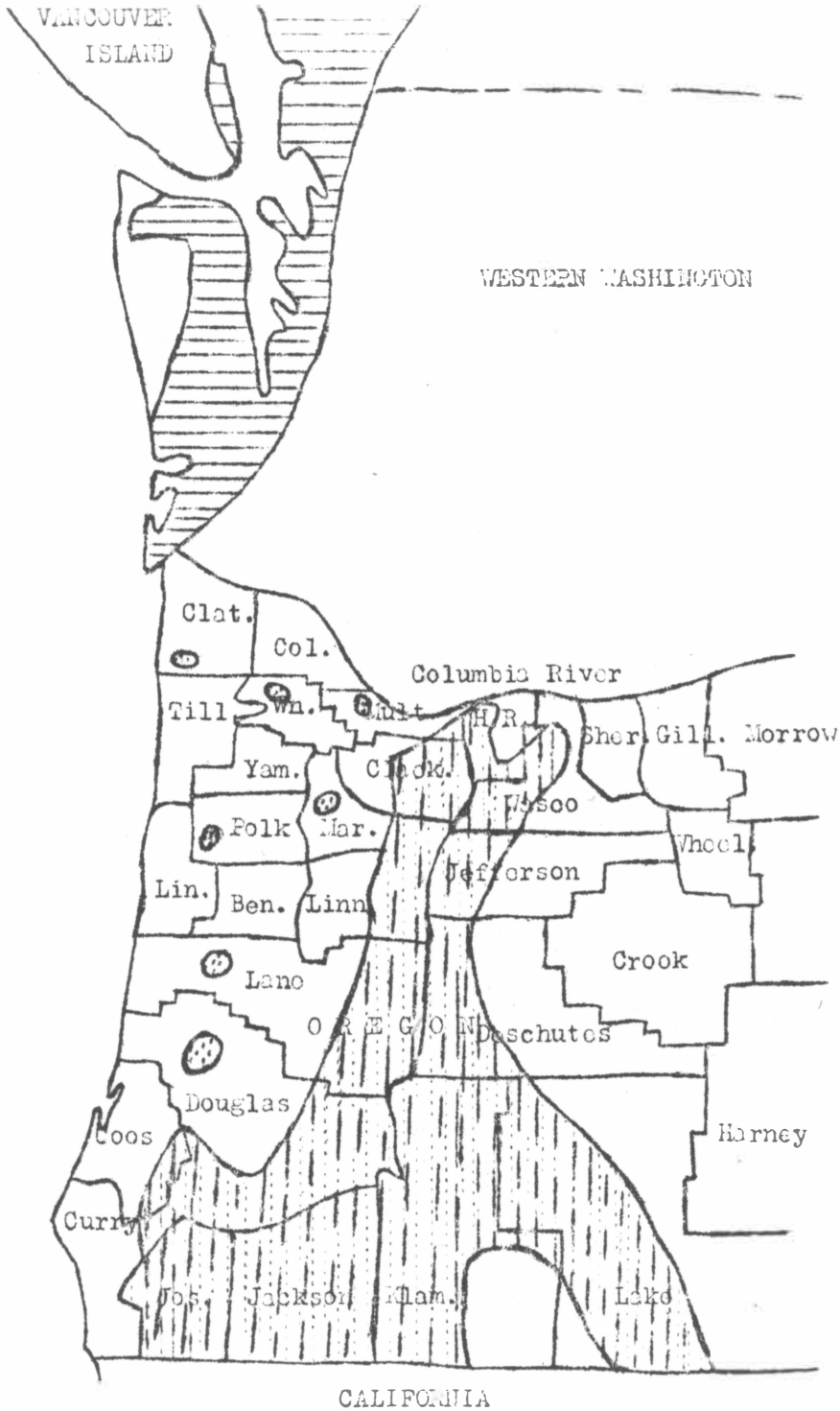
6. Field trips can readily be planned to study the distribution of white pines and wild currants and gooseberries.

7. Your district may be thoroughly canvassed for cultivated black currants and the pupils required to report their findings to you in writing.

8. Obedience to the state law declaring the cultivated black currant a nuisance can be made the topic for a discussion in citizenship.

9. Possibly friendly rivalry can be aroused between pupils or classes as to which can locate the most cultivated black currant plantings.

10. If a planting of cultivated black currants can be found nearby and the owners consent can be obtained it might be well to have an entire class visit the planting and search for evidence of blister rust.



General region in which blister rust infection has been found.

General distribution of white and sugar pines in Oregon. Much of the area indicated has only scattering trees but a sufficient number to spread blister rust.

A. Specimen encelopes bearing the following outline were sent to each teacher:

This envelope will constitute a location record of a cultivated black currant planting when the blanks are properly filled out and a black currant leaf from the planting is inserted.

Name of owner of cultivated black currants_____

City or Post Office_____

Street & No. or Rural Route & No._____

No. of cultivated black currant bushes in planting_____

Name of pupil reporting_____

Name of teacher_____

B. The following note to the teacher on a piece of paper 2½" to 5" was clipped to each set of specimen envelopes that were sent to each teacher.

Note to the Teacher: It is not our thought that you shall distribute these envelopes to the pupils. The teacher can handle them more satisfactorily. The idea is to make each envelope used a record of a cultivated black currant planting. A single envelope should never contain the leaves from more than one planting. In case more envelopes are needed they will be sent promptly on request. If you think the specimen is diseased, write "diseased" on the face of the envelope.

After the pupils have all reported, the envelope can be enclosed in the large addressed envelope.

PLANTS: THEIR STRUCTURE, RELATIONSHIP AND ORIGIN
LABORATORY MANUAL FOR STUDY
Course 102, General Botany, Part II.
DEPARTMENT OF BOTANY AND PLANT PATHOLOGY
Oregon Agricultural College
Corvallis

* * * * *

THE WHITE-PINE BLISTER RUST

A new menace to our western white pine forests.

The white pine blister rust has stopped reforestation in Europe with white pine, has destroyed large areas of white pine in the Eastern United States and menaces the white pine forests of the west. Its attacks are particularly severe upon young trees, although in the west it also attacks and kills mature trees.

I. Distribution.

White pine blister rust came to the United States from Europe about 1900 or earlier and has spread rapidly. It was received in shipments of white pine seedlings. It is now found in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, Pennsylvania, Minnesota, Wisconsin, Eastern Canada. A separate invasion has brought the disease into British Columbia and Washington.

The white pine blister rust, Cronartium ribicola Fisher, is a fungus closely related to other timber rusts and belongs to the same order of fungi as the very destructive stem and leaf rusts of cereals. They all belong to the class Basidiomycetes.

II. Hosts.

Two types of host plants are necessary for the life cycle of the white pine blister rust. It will grow upon any of the five-needle pines (or white pines) except Pinus arizonica and Pinus torreyana, and upon currants and gooseberries, wild or cultivated. Pinus arizonica and Pinus torreyana are not white pines. The white pines are as follows:

A. Pines
(a) American
Eastern white pine (Pinus strobus L.)
Western white pine (Pinus monticola Douglas)
Sugar pine (Pinus lambertiana Douglas)
Limber pine (Pinus flexilis James)
White Bark Pine (Pinus albicaulis Engelm)
Mexican white pine (Pinus strobiformis Engelm)
Foxtail pine (Pinus balfouriana A. Murray)
Bristle cone pine (Pinus aristata Engelm)

(b) Foreign

In addition to the above there are six species of foreign 5 needle pines and 10 varieties, that may become hosts for the disease.

B. Currants and gooseberries (Ribes and Grossularia)

All species of currants and gooseberries may act as the alternate host for the white pine blister rust. The black currants (Ribes nigrum) are especially susceptible.

III. Appearance of the disease.

The stems and branches of healthy young pines have a more or uniform diameter, while those affected with this disease always show a marked swelling. On old trees the disease is confined largely to the smaller branches but may work from them to the trunk.

The effect of the fungus is eventually to kill the bark and cambium of the parts attacked. This interferes with the work of the affected branches, to cause the death of the parts beyond the girdled point and where infections are very numerous may reduce the vitality of the whole tree. A trunk girdle will result in outright death. Young trees may become stunted in growth.

Death may occur in trees under 25 years old on account of trunk girdling caused by this fungous disease. On the Pacific Coast, trees older than 25 years have been killed by twig infection only, no girdling having occurred.

The leaves may turn yellowish, but this is not common.

The fruiting bodies on the thickened bark offer the most certain means of recognition. These appear from the latter part of April until the middle of June. They form whitish blisters which when ruptured allow the escape of clouds of bright yellow spores.

On currants and gooseberries, the white pine blister rust occurs only upon the leaves, where it produces two kinds of spores.

1. The first or summer form (Urediniospore)

Occurs on lower side of leaf as small, mealy, bright yellow masses hardly larger than a pin head. In the East from middle of June until the leaves fall. In the West urediniospores may be formed from about May 1st until the leaves fall, however, they are very scarce after October 1st.

2. The second or autumn form (Teliospores)

Occurs as small groups of from three to ten or twelve short, hairy outgrowths on the under side of the leaf, which are brownish in color. In the East from latter part of July until the leaves fall. In British Columbia they may be found as early as June 1st.

IV. Life History of the Disease.

After the white pines become infected, from two to six or more years are usually required before there is any external evidence of the existence of the disease. Swellings of the bark first appear and the healthy green color of the bark changes to a reddish or yellowish color. In the spring small drops of a clear, sweetish fluid exude from these swellings. The small spores contained within this fluid are called pycnospores, but they have no known function. They do, however, indicate the presence of the disease.

Very soon after pycnospores discharge, white blisters, as large as a child's finger nail, appear; they soon break open and the bright yellow aeciospores are blown away by the wind. These spores cannot cause infection on pine but only on currant or gooseberry leaves. They are long-lived and may be carried for many miles. If the required amount of moisture and the proper temperature is present, the aeciospores falling on the leaf germinate sending out a small germ tube which enters the tissues, living parasitically upon them. After a period of incubation of from 12-14 days a new crop of spores is produced, which always appear on the lower surface. These new spores are quite distinct from those on the pine. They are called urediniospores and may cause a rapid spread of the disease from currants or gooseberry to currant or gooseberry. A new crop of urediniospores being produced with each infection. These cannot infect pines.

From the latter part of July until the leaves fall the same infections that produced the urediniospores may produce still another type of spore. These new spores are produced on short, stout threads, or spore horns, in groups of three to ten or twelve and about one-fourth of an inch long. These spores are called teliospores. They are not scattered but germinate where they arise each sending out a short thread on which four tiny spores basidiospores (sporidia) are borne and discharged into the air. These cannot infect currants or gooseberries but can infect the pine through the stomata of the needles. Their life, however, does not exceed eight minutes, hence they cannot infect pines very far away from the bushes on which they were produced. This infection takes place mostly in late summer or fall. This completes the account of the life history of this very destructive timber disease.

See the chart of the life cycle of white-pine blister rust on page 65.

V. Control.

What can be done for the control? This question will be the subject of a lecture by Professor H. P. Barss, head of the Department of Botany and Plant Pathology at O.A.C., and member of the Executive Committee appointed by the White Pine Blister Rust Conference for the West held in Portland, Oregon, December 1922.

See page 66 for a statement on the work of the office of Blister Rust Control.

VI. Classification of White Pine Blister Rust

(Group) Thallophyte
(Class) Basidiomycetes
(Sub-class) Protobasidiomycetes
(Order) Uredinales
(Family) Uridinaceae
(Technical name) Cronartium ribicola Fischer
(Genus) (species) (authority)
(Common name) White pine blister rust

WRITTEN REPORT

Prepare report on the results of your observations on the specimens of white pine blister rust.

REFERENCES

Anonymous
1922 Pine Blister Rust in British Columbia
Amer. Forestry 28:125. Feb. 1922.

Anonymous
1922 White pine blister rust in the Western United States
U.S.D.A. Circ. 225:3-7. Figs. 1-9 (5 colored) June 1922.

Cooley, R. H.
1918 Parasitism, morphology, and cytology of Cronartium ribicola.
Jour Agric. Res. 15:619-660. Fig. 1 pls. 48-59 Dec. 23, 1918.

Detwiler, S.B.
1923 Spare the currant and spoil the pine.
Amer. Forestry 29:337-340. Illus. June 1923.

Detwiler, S. B.
1921 Safeguarding the white pine crop.
Amer. Forestry 27:7-11. Illus. January 1921.

Detwiler, S. B.
1922 Blister Rust appears in Puget Sound region.
Amer. Forestry 28:97-98. Feb. 1922.

Spaulding, Perley
1916 the white pine blister rust.
U.S.D.A. Farmers' Bul. 7:2:1-15 Figs. 1-5 pl. 1. June 9, 1916.

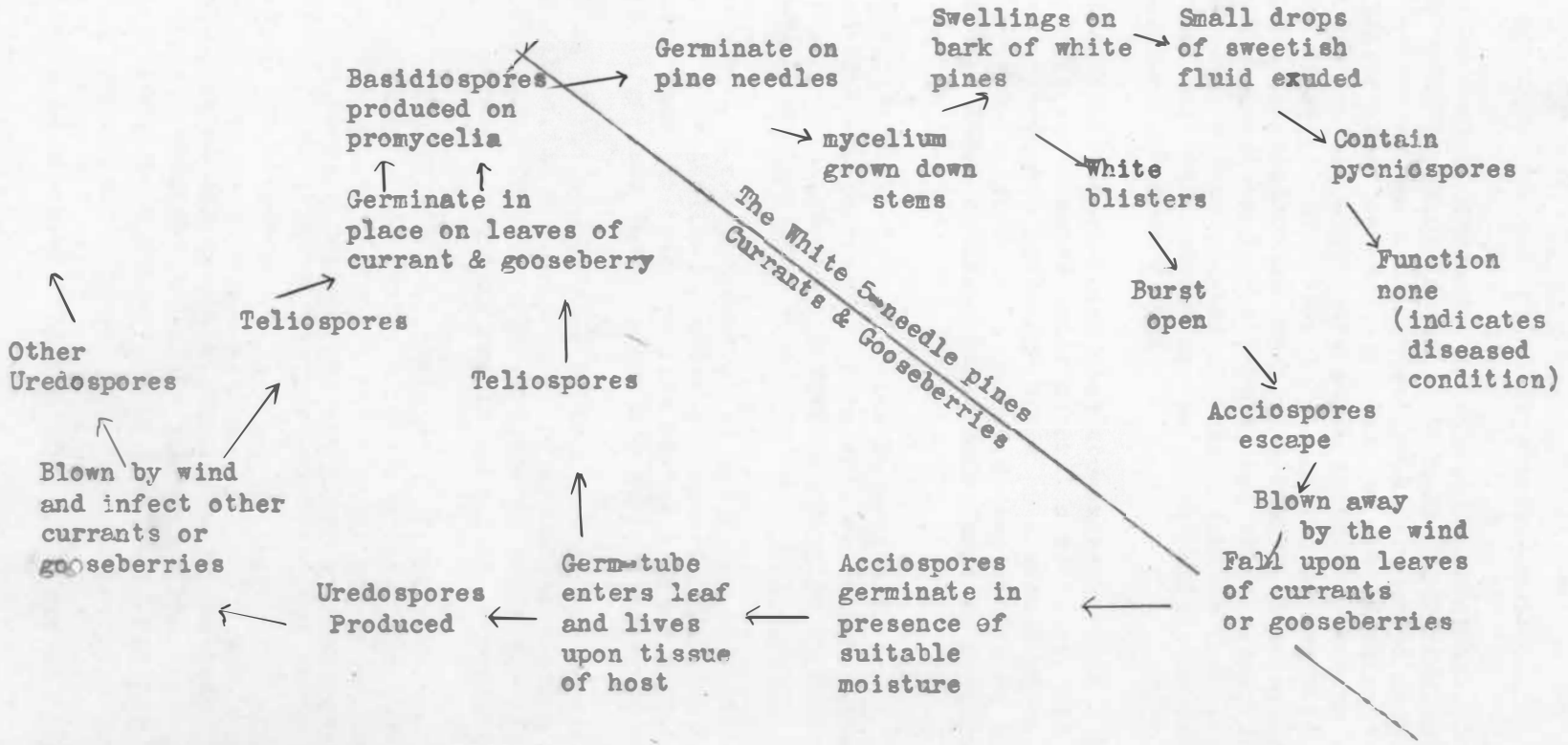
Report on white pine blister rust control for 1918. Bul. 2. For 1919 Bul. 4. Published by the American Plant Pest Committee.

For additional reference on the white pine blister rust see the Agricultural Index in the O.A.C. Library.

* * * * *

ALL SCIENCE IS PURE SCIENCE. ONLY PURE SCIENCE CAN BE APPLIED.

WHITE PINE BLISTER RUST
(Cronartium ribicola Fischer)
Diagram of life cycle


Swellings on bark of white pines
Small drops of sweetish fluid exuded
Germinate on pine needles
Basidiospores produced on promycelia
mycelium grown down stems
White blisters
Contain pycniospores
Germinate in place on leaves of currant & gooseberry
The White 5-needle pines
Currants & Gooseberries
Burst open
Function none (indicates diseased condition)
Teliospores
Other Uredospores
Teliospores
Acciospores escape
Blown away by the wind
Blown by wind and infect other currants or gooseberries
Fall upon leaves of currants or gooseberries
Germ-tube enters leaf and lives upon tissue of host
Acciospores germinate in presence of suitable moisture
Uredospores Produced

WORK OF THE OFFICE OF BLISTER RUST CONTROL
U. S. DEPARTMENT OF AGRICULTURE
Statement Prepared by
L. N. Goodding
Stationed at the Oregon Experiment Station.

The United States Government maintains experimental plots in two localities in British Columbia. In one of them all the different species and varieties of native currants and gooseberries are grown and their behavior toward blister rust is studied. Here we are learning that certain species are very susceptible while others are relatively immune to the disease, knowledge of great value when local control is resorted to. In the other locality a large circular area, in a heavily diseased region has been cleared of all currants and gooseberries and white pines. Young white pines clear of the disease have been planted in rows radiating from the center. Here it is hoped valuable information can be gained about the distance and rate of spread from diseased Ribes to pines.

The United States government also cooperates with the Canadian government in studying the disease under natural conditions. It must be remembered here that Canada has large areas of diseased pines in the Northwest, whereas, the disease in United States as far as known is confined to Ribes. Three diseased pines were found in Western Washington and these were removed.

In cooperation with the states the Federal Government is eradicating the cultivated black currant as it is well established that this is the most susceptible host. Eradication work is going on in Washington, Idaho, Montana, Oregon and to some extent in California.

Local control, i.e., the removal of all Ribes in white pine areas, is well under way in Northern Idaho, under government supervision. Although the disease is not present at this time its advent is inevitable. As the disease approaches larger and larger areas are to be placed under local control.

No problem of the proportions of this one can be handled by the Federal Government alone, so a wide program of education through the press, the schools, and state and federal organizations is being carried on. In this connection all possible agencies are brought into cooperation.

Federal men are kept in the field most of the year, scouting for the disease and for cultivated black currants, eradicating black currants, getting the distribution of the native Ribes and white pines and determining to some extent ecological conditions. Certain men are given special problems such as the determination of the climatic factors which control the direction, rate and time of spread of the disease.

State and Federal men maintain quarantines which prevent the introduction of currants, gooseberries and white pines from the eastern diseased areas to the west. Likewise, a quarantine is maintained against the State of Washington.

All the work is directed from the Western Office in Spokane, Washington.

Washington

Work under project 2 in Washington consisted of cultivated black currant eradication, general educational work, nursery inspection, and scouting for the disease. This work was carried on without the basis of a cooperative agreement with the Washington State Department of Agriculture, and was directed from the Spokane office.

Cultivated Black Currant Eradication.

Cultivated black currant eradication was carried on in Washington from May 1 to August 15. Two two-man crews were in the field for this period. The work was confined to the four northeastern counties. The plants were located by the crews and the owners were then asked to remove them, to protect the white pine timber.

The following tabulation gives the results of this work:

Table 19

Status Cultivated Black Currant Eradication Work, Washington, November 30, 1923.

County	Eradicated		Not Eradicated		Total	
	Plantings	Plants	Plantings	Plants	Plantings	Plants
Ferry	34	250	2	16	36	266
Pend Oreille	9	26	8	44	17	70
Spokane	177	864	39	387	216	1251
Stevens	84	432	5	23	89	455
Total	304	1,572	54	470	358	2042

All cases of plants not eradicated are still pending. Further efforts are being made to effect the removal of these plants.

Nursery Inspection

During the past field season a thorough inspection has been made of the nurseries of Washington. The purpose of this was to determine if blister rust existed in any nursery, from which it might be spread by plant shipments. An examination of the nursery inspection records of this office for previous years indicated which of the Washington nurseries handled currants, gooseberries, or white pines. These, together with any recently established nurseries, were visited. A total of sixty-three nurseries, in

twelve counties was inspected. Seventeen of these nurseries had cultivated black currants, with a total of 1,039 bushes. At the time of, or shortly after inspection, eleven of these nurseries destroyed their cultivated black currants. The cultivated black currants in the remaining 6 nurseries are being destroyed by order of the Washington State Department of Agriculture. The following report by Mr. G. A. Root gives the details of this work:

NURSERY INSPECTION IN WASHINGTON

SEASON 1923

The following is a list of the Washington nurseries inspected during the season of 1923. The list includes those which have Ribes or white pine and new nurseries or nursery prospects which have been "followed up".

Nursery	County	Town	No. Bl. Currants	#Ribes R. & G.	No. Pine	Remarks
J. C. Kittell	Adams	Ritzville	-	8	-	Home use only
Home Nursery	Benton	Richland	1	293	-	Bl. Cu. removed 1923.
Kennewick Nursery	"	Kennewick	-	-	-	Given up growing Ribes
F. E. Green	"	"	-	135	-	Bl. cu. removed 1922.
Prosser Nursery	"	Prosser	-	40	-	" " " "
Milot - Mills	Chelan	Wenatchee	-	185	-	" " " "
Columbia & Okanogan	"	"	-	2,425	-	" " " "
Chelan Greenhse. & Nurs. Co.	"	Chelan	11	27	-	
Ison Skaggs	"	Wenatchee	-	-	-	Strawberries only
Geo. Larner	Chelan	Wenatchee	-	-	-	Seeds only
Okanogan Valley Nurs.	Okanogan	Tonasket	-	-	-	Trees only
Johnson & Thayer	"	Okanogan	-	-	-	" " for own use
Walter May	"	"	-	-	-	Trees only.
Sudbury Nursery	King	Bothell	2	250	-	Mostly ornamentals
Bonnell Nursery	"	Seattle	-	150	161	Bl. cu. removed 1922.
Seattle Nursery	"	"	1	90	-	" " " 1923.
Hopkins Nursery	"	Tukwila	-	60	-	" " " 1922.
Benton Jct. Nursery	"	Benton Juct.	-	45	-	" " " 1922.
Whitney Nursery	"	Seattle		225	-	Sells few Ribes
Murphy's Nursery	"	Seattle	8	-	3	Bl. Cu. removed 1923
Chas. H. Waight	"	"		-	-	Pines removed 1923
Lester & Monohan	"	"	12	-		Bl. Cu. removed 1923
Peter Kempf	"	"	-	27	-	
Christopher Nursery	"	Christopher	6	250	-	Bl. Cu. removed 1923
King's Nursery	"	Seattle	45	295	-	
Malmo's Nursery	"	Georgetown	2	15,000	17	Bl. Cu. removed 1923
Burdett Co.	"	Seattle	8	25	7	" " " "

Nursery	County	Town	No. Bl. Currants	#Ribes R.&G.	No. Pine	Remarks
Otto Heege	King	Seattle	-	-	-	
J. A. Boyce Nursery	"	"	211	-	-	Bl.Cu.removed 1923
Green's Nursery	"	"	-	60	-	Home use
Morris Nursery	"	"	-	1	1	P. monticola
Evergreen Nursery	"	Medina	-	300	-	Bl.cu.removed 1922
Kirkland Home Nurs.	"	Kirkland	1	30	-	
Richmond Nursery	"	Richmond Beach	-	75	124	Bl.cu.removed 1922
Moore's Nursery	Kitsap	Poulsbo	-	-	-	" " " "
Frank C. Schricker	"	Bremerton	-	-	-	Ornamentals only
E. H. Urban	"	"	-	-	-	Grapes only
Mt. Adams Nursery	Klickitat	Husum	-	-	-	Trees only
White Salmon Nurs.	"	White Salmon	-	-	-	" "
Townsend Nursery	Lewis	Centralia	-	900	-	
Skookum Nursery	"	"	-	2300	-	
Fairview Nursery	"	Chehalis	-	-	-	Flowers only
Geo. I. Wibra	"	"	-	-	-	Greenhouse
Mietke's Nurs.	Pierce	Tacoma	-	-	8	
Frank F. Williams	"	"	-	15	1	Bl.cu.removed 1922
Rosecroft Nursery	"	Sumner	22	186000	-	Bl.cu.removed 1923
G. E. Davis	"	"	-	10000	-	Bl.cu.removed 1922
Goodland Park Floral Co.	"	"	-	-	-	Greenhouse & Ornament
Jas. Stafford	"	"	-	2300	-	Raises for fruit and sells some.
Benthein's Nurs.	"	Gardenville	-	325	5	Bl.cu.ramoved 1922
Geo. Lawler	"	"	-	8	8	" " " "
Western Wash. Exp. Station	"	Puyallup	-	1400	-	" " " "
McCormack Bros.	"	Tacoma	-	-	-	Dealer
A. H. Melavitch	"	"	-	-	-	"
Mrs. C. H. Turner	"	"	-	-	-	Flowers
Puyallup Nursery	"	Puyallup	-	288	-	
Yokes Nursery	"	"	-	450	-	
Mt. Vernon Nursery	Skagit	Mt. Vernon	-	15	1	Removed 31 white pine 1923
Meadowdale Nursery	Snohomish	Meadowdale	-	65	-	Bl.cu.removed 1922. White pines 1923
Edmunds Nursery	"	Edmunds	-	1200	21	P. monticola
Sullivan Nursery	"	Everett	-	1	30	P. monticola
Everett Fruit & Products Co.	"	"	-	-	-	Dealers may raise Ribes in future
H. H. Peterson & Sons	"	"	-	-	-	Removed Red cu.last yr.no longer dealer in them
Overman Nursery	Spokane	Spokane	-	31	-	Bl.cu.removed 1922
E. C. Balzer	"	"	-	7	-	

Nursery	County	Town	No. Bl. Currants	#Ribes R.&G.	No. Pine	Remarks
H. L. Olson	Spokane	Spokane	5	-	3	Bl.Cu.removed 1923
Krause Nursery	"	"	-	185	10	" " " 1922
Spokane Nursery	"	"	-	14	-	" " " 1922
Riverside Nursery	"	"	700	1,645	47	" " " 1923
City Park Nursery	"	"	-	100	15	" " " 1922
Bade Brothers	Walla Walla	Walla Walla	-	53	-	Ornamentals & Fruit Trees
Adolph Allenbach	Whatcom	Bellingham	-	-	-	White Pine Removed 1922
Meridian Greenhouse	"	"	-	16	4	
Bay View Cemetery Nur	"	"	-	48	11	Bl.Cu.removed 1922
Bellingham Nursery	"	"	-	252	-	" " " 1922
Cyrus Applegat	Yakima	Yakima	1	18	-	" " " 1923
Hamilton Nursery	"	"	-	-	-	Trees only few red cu. & gooseberries for home use.
Yakima & Columbia River Nursery	"	"	200	1,850	-	
Naches Hts. Nursery	"	Naches	15	150	-	
(Yakima Valley (Toppenish Nurs. (Washington Nurs.	"	Toppenish	5	40,000	-	Bl.Cu.removed 1923
Fruitvale Nursery	"	Yakima	-	-	-	Trees only
Ingalls Nursery	"	Wahato	-	-	-	" "

The above list comprises 85 nurseries or nursery prospects. Three nurseries have removed their white pines since 1922.

The following nurseries still possess black currants:-

Table 21

Chelan Greenhouse & Nursery Co.	Chelan	Chelan				11 Black Currants
Sudbury Nursery		Bothell				2 " "
Kirkland Home Nursery		Kirkland				1 " "
C. P. King		Seattle				45 " "
Yakima & Columbia River Nursery		Yakima				200 " "
Naches Height Nurs.		Naches				15 " "

A careful inspection of the above nurseries revealed no blister rust infection either on the pines or Ribes.

Scouting for the Disease

In addition to the scouting for the disease carried on in conjunction with the cultivated black currant eradication work, additional scouting for the disease was carried on later in the season. Three crews were in the field during September and October, scouting in the northern portion of Washington east of the Cascades. As a result of this scouting 20 cultivated black currants were found infected at Danville, Ferry County, 30 cultivated black currants and 1 cultivated red currant were found infected at Chesaw, 2 cultivated black currants infected at Loomis, 1 cultivated black currant at Molson, 5 cultivated black currants at Oroville, and 4 cultivated black currants at Tonasket, Okanogan County. These infected plants were out of a total of 1604 cultivated black currants and 2731 wild Ribes inspected.

Of the 63 currant plants found infected in eastern Washington, 1 plant was a cultivated red currant and 62 were cultivated black currants. The single red currant bush had very slight infection on only 3 leaves. This plant was growing in actual contact with a cultivated black currant bush on which 30% of the leaves were quite heavily infected.

The infections in Ferry and Okanogan Counties constitute an admirable example of the efficacy of cultivated black currant eradication in delaying the spread of the disease. Extensive examination of wild Ribes in this region failed to reveal the presence of the disease. The cultivated black currants in Ferry and Okanogan Counties were the obvious cause of the disease appearing there.

Out of the ten infected plantings in eastern Washington, four were voluntarily destroyed by the owners. The remaining six plantings are being removed by order of the Washington State Department of Agriculture, through the cooperation of Mr. C. L. Robinson, Supervisor of Horticulture.

Scouting for the Disease - Western Washington

During the late fall of 1923, two men carried on a limited amount of scouting for the disease in western Washington. Because of the time and expense involved, no attempt was made to cover the entire area of western Washington. Infection was found at eight points in six counties. The results, as given in the following table, would indicate that the rust is prevalent over the Puget Sound region.

Table 22

Scouting, Western Washington

County	Town	Species	No. Plants Infected
Thurston	Yelm	Cultivated Black Currants	10
Kitsap	Port Orchard	Ribes bracteosum	2
King	Silver Lake	Cultivated Black Currants	2
"	" "	Ribes bracteosum	3
Mason	Shelton	" "	3
Jefferson	Hadlock	" "	2
Snohomish	Everett	" "	2
"	Stanwood	" "	1

During the spring of 1923, limited scouting in areas which had showed heavy Ribes infection the preceding fall failed to show the presence of infected pines in the Puget Sound region.

British Columbia

Scounting for the Disease.

In conjunction with the scouting for the disease in northeastern Washington and northern Idaho in September and October, scouting was also performed in southern British Columbia along the border from Grand Forks, British Columbia, east to Cranbrook, British Columbia. This work was done because of the relatively greater abundance of cultivated black currants just across the line, and consequent larger chance of finding infection close to our white pine areas.

In the course of this work, nearly 22,000 cultivated black currants were inspected. Two infected plantings of cultivated black currants were found at Nelson, B. C., and one at Grand Forks, B. C. No infection was found on wild Ribes.

California

No work under Project 2 was carried on in California during 1923, for the following reasons:

1. Because of shortage of funds this office was unable to give California the assistance of one of its men in carrying on a cultivated black currant campaign in California on a permanent basis.

2. Inasmuch as the rust is approaching California from the northward, it was felt that the greatest immediate protection to the sugar pine stands of that state would be gained by concentration on the removal of cultivated black currants from the coast region of Oregon.

3. As the rust is much nearer the Inland Empire white pine stands than the sugar pine stands of California, it was considered advisable to first carry on intensive work in the Inland Empire.

On the occasion of Mr. S. B. Detwiler's trip to California, in August, 1923, Mr. G. H. Heke, Director, California State Department of Agriculture, expressed his willingness to institute a cultivated black currant eradication campaign in that state through the activities of the County Horticultural Commissioners and their deputies, assisted by this office. In respone to instructions from Mr. Detwiler, Mr. S. N. Wyckoff immediately proceeded to California, to assist in the organization of such a campaign. At a meeting in

Sacramento, California, on August 9, at which Mr. L. A. Strong, Chief, Bureau of Plant Quarantine, California State Department of Agriculture, Mr. Detwiler and Mr. Wyckoff were present, it was considered advisable by Mr. Strong to start such work in southern California. In response to a request from Mr. Strong, Mr. Wyckoff proceeded to Los Angeles, California. On August 17, a meeting was held at Los Angeles, attended by Mr. Strong, Mr. C. H. Vary, Deputy Quarantine Officer, California State Department of Agriculture, Mr. Wyckoff, and the County Horticultural Commissioners of San Diego, Imperial, Orange, Riverside, San Bernardino, Los Angeles, Ventura, and Santa Barbara counties. At this meeting, plans were laid for an active campaign by the Horticultural Commissioners of these counties, to secure the eradication of cultivated black currants. This campaign was to be assisted by this office by the preparation of educational and publicity matter, to be issued to the several Commissioners through Mr. Strong's office.

On August 21, Mr. Wyckoff returned to Spokane, and immediately prepared and forwarded to Mr. Strong such information on blister rust, white pine values in California, and successful educational and publicity methods used in the Northwest as was considered to be of value for this work. The following matter was sent to Mr. Strong with the letter as given below:

* * *

Spokane, Washington

August 27th, 1923.

Mr. Lee A. Strong,
Chief Quarantine Officer,
State Department of Agriculture,
Sacramento, California.

Dear Mr. Strong:-

In accordance with the plans suggested at Los Angeles the early part of August I am enclosing herewith some information on the value and uses of sugar pine and some other matter which may be of use in the eradication work in California.

For the work as planned it would seem to me that the following supplies might be issued to the County Horticultural Commissioners, to be distributed by them to their District Inspectors:

1. All old records of cultivated black currant plantings.

2. Ribes census cards.

3. Release statements.

4. California Ribes keys.

5. Questions and answers concerning blister rust.

6. Notation giving distinguishing characters of cultivated black currant.

7. U. S. Department of Agriculture Circular 226.

The old records of cultivated black currant plantings, including those made last year, are in your office. Those for southern California, which were recently sent to Mr. Vary's office, I segregated according to counties and left with Mr. Vary. A few records for northern California were found with them. I have segregated these out, and am returning them herewith to you.

While in Los Angeles, you told me that you had some of the Ribes census cards on hand. If your present supply is not sufficient, I shall be glad to supply you with more.

Some time ago, Mr. Hecke stated to Dr. Meinecke that he would be glad to issue the Ribes keys of California to the County Horticultural Commissioners and District Inspectors if a sufficient supply was available. We are now having a considerable number of these booklets prepared in the Washington office, and they will be available in sufficient numbers in the near future.

Please let me know if you require an additional supply of Curcular 226, and I can send them to you at once.

The publicity matter which I am sending consists largely of pertinent extracts from various publications. It is not, of course, in final form for use, but I thought that it would probably better suit your needs as I have given it, as it can then be used in any way which seems to you advisable.

We are fairly well equipped at this office to do mimeographing, and possibly we can be of assistance in this way. If you want any of these forms or notations mimeographed, just let me know how many are needed, and we shall get them out.

I shall be greatly interested in hearing from you, particularly in regard to the area of the state you contemplate working at the present time, and the progress of the work. Please feel free to call upon me or this office for anything that we can do to assist you.

Sincerely yours,

(S.) Stephen N. Wyckoff,

Pathologist.

snw/ca

DESTROY CULTIVATED BLACK CURRANT TO SAVE WESTERN WHITE PINES

By Samuel B. Detwiler
Pathologist in Charge, Office of Blister Rust Control, Bureau of Plant Industry, United States Department of Agriculture.

In the Western United States, white pine blister rust presents a more serious problem. It was first found in British Columbia and western Washington in the Autumn of 1921. In cooperation with the Northwestern States and the Dominion of Canada, the Bureau of Plant Industry determined the extent of the rust outbreak in 1922. The blister rust was found to have been present on planted white pine in Vancouver, B.C. as early as 1910. These trees were purchased in 1910 from a nursery in France, and are probably responsible for the introduction of the rust. This French nursery also shipped white pines infected with blister rust into the eastern United States in 1910. At that time there were no quarantines in the United States and Canada to prohibit importation of white pines from abroad.

Assuming Vancouver as the center of spread, the present known distribution of the rust is north (on pines and currants) to the limits of white pine growth; east (on pines and currants) to Revelstoke and Beaton, B. C., and south (on cultivated black currants) through western Washington to the Columbia River. The infection area lies within a triangle of country approximately 300 miles on a side. Beaton is about 100 miles north of Idaho, and white pine growth is continuous from this point into the United States.

The blister rust has shown unprecendented severity of damage in western British Columbia. Large trees are killed as readily and rapidly as small ones. The western white pines growing close to infected currants are killed by innumerable blister rust cankers on the twigs. For example, over 200 cankers were counted on only two branches of one heavily infected tree. In this way a tree is killd in much less time than where a single branch is attacked, and the fungus grows back on the branch until it reaches and girdles the trunk. The western white pine is even more susceptible to blister rust attack than the eastern white pine, and conditions in the West favor an epidemic of great destructive force.

The fungus is permanently established in the West, but its spread can be delayed and controlled. A constructive program of action against the disease was recommended by the third Western White Pine Blister Rust Conference, at Portland, Oregon, in November, 1922, as follows:

Rigid enforcement of quarantines to prevent introduction of the disease at points where it is not yet present.

Abandonment in the western States of the growing of cultivated black currants, the most susceptible host plant of the blister rust and one of the most active agents concerned in its spread.

Experiments in the regions where white pine is of greatest present and future importance, to determine the most economical methods of applying local control.

Investigation of the scientific facts of this disease in the West, its rate of progress and damage, susceptibility of host plants, and discovery of natural factors which may be used to retard spread or to increase effectiveness of control work.

Educational and demonstrational work to secure the adoption of the best methods of controlling the disease as rapidly as they become available through cooperation with State, private and other agencies responsible for the protection and management of western forests.

The work which is being undertaken in the West is a vigorous effort to reduce losses from the rust to the economic minimum. It contemplates delaying the progress of the disease, protecting uninfected areas as long as this can be done at reasonable cost, and meanwhile developing and establishing the best methods of local control for commercially important white pine areas.

There is every indication that local control will be as effective in protecting the white pines of the West as it is in the East. The exact cost of such local protection, and therefore the extent to which it is practicable under western forest conditions, remains largely to be determined. Preliminary experiments in Idaho in 1922 indicate that the wild currants can be destroyed over large tracts of mature timber at an annual cost of 5 cents to 12 cents per thousand feet of merchantable white pine. The annual charge for blister rust protection in young western white pine stands in Idaho probably will average less than 25 cents per acre and may possibly be as low as 5 cents per acre per year under improved methods.

The war against cultivated black currant is the most important part of the effort to delay the rapid spread of the blister rust. Dr. J. S. Boyce, of the Office of Forest Pathology, who directed the Federal field investigations on the disease in the Northwest during the past season, states.

"The English black currant without doubt is mostly responsible for the long distance spread of the disease and its establishment in new localitites. A study of blister rust in the Northwest cannot but lead to the conclusion that without the English black currant, the spread of the disease south and east from the Vancouver region would have been very slow and that the most efficient means to delay the spread of the blister rust isto remove this currant from the Pacific slope States."

The State of Washington has cleared out cultivated black currant plants from the counties in the western part of the state. Oregon and Idaho have new laws permitting the destruction of cultivated black currants, and are planning to use various means to accomplish this purpose. Plans are also being made in Montana to secure the elimination of these bushes from the western part of the state.

The western white pine of the Inland Empire and the sugar pine of California and Oregon are by far the most valuable timber trees in the regions where they grow, and under the present forestry outlook the former is irreplaceable. The present merchantable stand of these species is estimated at slightly more than 57 billion board feet, valued at approximately $228,400,000. This timber is constantly increasing in value as eastern supplies are exhausted, and is nearly three times the remaining stand of eastern white pine. In addition to the 8 million acres of old growth timber, there are from 12 to 13 million acres bearing young growth in which western white pine or sugar pine should form permanently an important part of the stand. The Federal Government is directly and deeply interested in dealing adequately with the blister rust situation in the West, through its ownership of approximately one third of the standing timber menaced by the disease, and large areas of young growth where the five-needle pines are of exceptional importance from the standpoint of forest management.

White pine blister rust is one of the many destructive pests from foreign shores that has come to stay. Each one of these pests brings added difficulties for the farmer, horticulturist, or forester, and increased living costs to all. The blister rust was brought here on white pine seedlings imported from Europe and set out in several hundred forest plantations in the United States and Canada. Had the Federal and Dominion quarantines now in effect against importing nursery stock from foreign countries been in existence two or three decades earlier, they would almost certainly have prevented the introduction of the blister rust, chestnut blight, citrus canker, Japanese beetle, and other imported pests we now have to combat. It is a special duty of foresters to become acquainted with such facts and give their active support to quarantine regulations restricting the spread of forest pests within the nation and preventing the introduction of new pests from abroad.

Extracts from "California White & Sugar Pine Industry."

Prepared by

The California White and Sugar Pine Manufacturers' Association.
San Francisco, California.
1922

Sugar pine belongs to the white pine group and botanically and physically closely resembles its eastern relative, the famous Lake States white pine. The trees grow tall, straight and with a clean trunk, which has an important bearing on its value for lumber. The average height is from 150 to 175 feet with a diameter of from 4 to 5 feet, although trees have been found 230 feet in height and 12 feet in diameter. This is the largest pine in the world.

* * * * * * * * * * * *

The wood of sugar pine is soft, straight-grained, easily worked and holds its shape. This sums up briefly its quality and value as a worthy successor to eastern white pine. In fact, in the same markets, for the same uses, these two pines are practically identical. An amusing instance is told of an old eastern pattern maker located in California who sent East for some "cork" pine as he could not use sugar pine. He was furnished some sugar pine shipped originally to Chicago and reshipped to California as white pine. This proved to be entirely satisfactory in every way. Sugar pine stands on its merits as the best all around soft wood available in any quantities in the world.

No attempt can be made to enumerate the articles for which sugar pine is adapted, but its wide utility may be judged by some of the following examples:

In house building sugar pine may be profitably employed for practically the complete house, including ceiling, siding, flooring, panels, brackets, railing, sash and doors, lath, built-in fixtures, moulding and partition. The carpenter can do more with it, and with less, effort, than with any other wood. It may

be quarter-sawed, and presents an attractive grain. Large quantities of lath are made from slabs. Window sash made by machinery has taken the place of the hand made article of a few years ago, but the same high grade lumber is demanded.

Sugar pine doors meet a large and exacting demand. The light weight of the wood, its cheerful color, satiny finish and its freedom from warping gives it a value in every market. It is too soft for floors subjected to heavy wear, but for boat decking is unequaled. As siding and boat cabin finish it has few equals. It paints well, holds its form, lasts a long time and is very attractive, in appearance. It is extensively used for shelving in cupboards, pantries and fruit closets. Few woods equal it for outside and inside window blinds and curtain rollers.

In furniture, articles wholly made of sugar pine are unusual but it enters into many parts. It is often found as parts of bookcases, cabinets, cupboards, presses, washing machines, and as tops for kitchen tables. For drawing tables it is the best wood. The makers of church furniture find a number of uses for sugar pine.

The lower grades are largely used in the manufacture of boxes and crates because of its light weight and ease of nailing. These include merchandise cases, piano and organ boxes, and cases in which are packed candies. Tobacco cases are also made of it and in fact so many different kinds that specific reference would be impossible.

Parts of many farm machines may be made of sugar pine. For hoppers, sieve frames, parts of screens, boxes, drawers, seed holders, tool carriers, and many other portions of farming mills, reapers, drills, tedders, threshing machines, corn shellers, operators, and scores of other apparatus and appliances that are necessary to a modern farm, it holds an important place. It is also extensively used for dairy machinery and appliances.

Many bee men prefer it to most other wood for hives and frames, and poultry men consider that its lightness fits it above many others as material for egg crates, brooders, incubators and other poultry-yard appliances.

No other wood except white pine equals sugar pine for pattern making. The pattern maker wants a soft, solid material

that will work smoothly across the grain, and spongy woods and those of crooked grain and with knots will not do. On account of the large size of sigar pine timber, thick wide clear pattern planks are obtained in large quantities.

A large proportion of the matches produced in the United States are made from sugar pine on account of its light weight, ease of manufacture, agreeable appearance, necessary strength and the quickness with which the coal dies after the blaze has been extinguished.

Its clear grain and ease of cutting with and across the grain makes it highly desirable for scroll work and for cornice and capital decoration.

Sugar pine is without superior for all sorts of toys, including wheelbarrows, hobbyhorses, wooden soldiers and dolls, blocks and letters and the seats and other wooden parts of doll buggies, chairs, stools, carts and swings.

Its softness and light weight are properties considered in choosing it for drawing boards, cutting boards, cloth boards, and pen holders.

Sugar pine is extensively used for piano keys. It has other uses in piano and organ building, and for some purposes is substituted for holly. It is an excellent wood for pipes in pipe organs and for that purpose has no equal.

Some of the miscellaneous uses which indicate the wide adaptability of this wood are for parts of airplanes, automobile and auto and truck bodies, auto running boards, instrument boards, boat building, drain boards, concrete forms, plasterers' tools, railway cars, store fixtures, trunks and turning.

Extracts from U. S. Department of Agriculture Bulletin 426.

Sugar pine is the most valuable commercial timber tree on the Pacific Coast, and its relative value among all the conifers of the world is very high. This is attributable partly to the characteristic straighness and unusual clear length of the trees and partly to the excellent physical qualities of the wood, which adapt it admirably to high class uses in manufacturing trade.

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Industry	Feet used, b.m.	% of Total	Industry	Feet used, b.m.	Per cent of total
			millwork		
Boxes and packing	20,536,000	58.763	Sash, doors, blinds, general	11,930,303	34.140
Brushes	3,440	.010	Ship & Boat building	75,000	.220
Elevators	15,000	.043	Tanks	10,750	.031
Fixtures	150,000	.430	Trunks and valises	11,000	.031
Frames and molding	2,730	.008	Vehicle parts	1,000	.003
Furniture	364,410	1.043	Wood carvings	3,000	.008
Musical instruments	4,700	.014	Woodenware & Novelties	418,563	1.200
Instruments, professional & scientific	500	.001	Miscellaneous	40,000	.120
Machines parts	4,000	.012	Total	34,946,956	99.9
Patterns	59,350	.113			
Planing-mill products	1,317,060	3.770			

Table 14.--Amount of sugar pine lumber used in various California industries in 1910.

With the advent of the sawmill in California, the more accessible stands of sugar pine were eagerly sought by the lumbermen because of the superior quality of the lumber. Its durability, lightness, and softness as

compared with other available woods led to its use for shakes, flumes, sluice boxes, bridges, houses, barns, fences, and numerous other purposes. Shingle manufacture has to some extent replaced shake making. The early demand created by the fruit industry for trays and boxes was met largely by the sugar-pine mills. With increased use prices were stimulated, good grades increased in value, and the lower grades were utilized in box making. Because of its color, lightness, and freedom from taste and odor, sugar pine has remained a favorite with raisin packers. Some mills work a portion of their output into raisin trays, some specialize in raisin boxes, and nearly all utilize their poorer grades for box shooks or dispose of them to box makers. About 65,000,000 feet are used in California in bridge construction, sluicing, dimension stock, and general building material.

Because of its straightness, softness, freedom from warping and shrinkage, splendid service when exposed to weather, and fine finishing qualities, sugar pine is a very important wood in the manufacture of special-order sash, doors, and blinds, decks of boats, and general millwork. These same qualities make it valuable for frames and stairwork. For pattern and model making, which require woods easily worked, glued, and nailed, it is a close second to white pine. Fixture manufacturers use it for alters, beading, show cases, counters, veneer cores, shelving, and drawers. Freedom from taste and odor make it especially valuable for druggists' drawers, for compartments for spices, coffee, tea, rice, sugar, and other provisions, and for shelving. Furniture manufacturers turn it into backing, built-in dressers, sideboards, carved work, corestock, table frames, and tops. Tanks, hot-grease vats, troughs, and water boxes, requiring freedom from taste and permanence, are frequently of this wood. Its lightness recommends its use for special trunks and sample cases. Its straight grain and permanence give it a place in the manufacture of piano and pipeorgan keys and actions, and player pianos; and the same qualities, together with lightness, place it among the best woods for drawing boards and extension level rods.

Large quantities are used in planing mills in the manufacture of out siding, interior finish, and moldings. It takes readily the finest enamel finish.

In addition to the above, sugar pine is used for drainboards, elevator floors, brushes, (brush blocks), apiary supplies, machine parts, saddles (saddle trees), shade and map rollers, wood carvings of all kinds, oars, slack cooperage, woodenware, bakers, work boards and troughs, dresser brackets, and small turnings and fencing. A large quantity is made into matches.

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The following correspondence will indicate the final status of this work:

624 Realty Building
Spokane, Washington
November 14th, 1923

Mr. Lee A. Strong, Chief
Bureau of Plant Quarantine
State Department of Agriculture
Sacramento, California

Dear Mr. Strong:-

At the present time this office is preparing a report on the season's blister rust work in the West, for the Executive Committee of the Western White Pine Blister Rust Conference. We are, accordingly, gathering into concise form the results of all recent work. To incorporate into this general report, I should like very much to have from you a report on the cultivated black currant eradication work as carried on in California this season. I shall be particularly interested to learn of the success the County Horticultural Commissioners have had in this work, since our meeting in Los Angeles last August. If they have encountered any special difficulties we should be glad to hear of them, to see if it is possible to assist in any way.

If possible, we should like to have definite figures on the number of cultivated black currants eradicated in the several counties, an account of the publicity work done, and any suggestions for the form that future work should take.

Hoping to hear from you in the near future in regard to this matter, I remain.

Sincerely yours,

(S.) Stephen N. Wyckoff

snw/ca

Pathologist

STATE OF CALIFORNIA

DEPARTMENT OF AGRICULTURE

Sacramenta, California
November 17, 1923

Mr. Stephen N. Wyckoff,
624 Realty Building,
Spokane, Washington

Dear Mr. Wyckoff:

In reply to your letter of November 14; there has been no concerted action toward the eradication of black currants in California. As a matter of fact following the meeting you attended in Los Angeles I am frank to say that nothing was done toward this sort of a campaign. I am convinced that no comprehensive work of this nature can be undertaken until such time as there is a man assigned by the Federal Government to direct or head up the work in California. It seems to me to be almost impossible to impress upon anyone here the necessity of eradicating cultivated black currants when the white pine blister rust is apparently so far removed from California.

Very truly yours,

(S.) Lee A. Strong

Chief,
Bureau of Plant Quarantine
and Pest Control

las/h

General Educational Work

During the summer season of 1923 four circular letters - Exhibits 1, 2, 3, - were sent out to the following classified mailing list:

Canadians	8
Forest Service	
District 1	29
District 5	27
District 6	26
Colleges and Universities	20
State and County Officials	14
Oregon Fire wardens	16
Transportation Agencies	5
Protective Associations	69
California Lumbermen	276
Idaho "	288
Montana "	222
Oregon "	737
Washington "	715
Idaho Nurserymen	28
Montana "	16
Oregon "	155
Washington"	287
Miscellaneous	35
Total	2968

Exhibit 1

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

624 Realty Building
Spokane, Washington
September 17th, 1923.

Blister Rust Control

Dear Sir:-

Advice concerning scouting for white pine blister rust by the Canadian forces in eastern British Columbia states that this disease has recently been found on Cultivated Black Currants at Burton, Nakusp, Arrowpark, Graham's Landing, Carroll's Landing, Needles and Farquier. This rapid spread of the rust from the Revelstoke district is largely due to the prevalence of cultivated black currants along the valley of the upper Columbia River. The southern-most point where the rust has been found in eastern British Columbia is only about 60 miles from the northern boundary of Idaho. Due to the prevalence of cultivated black currants in the intervening portion of British Columbia and the air channel formed by the upper Columbia River valley a continued spread of the rust southward to the international boundary is anticipated.

Rapid progress is being made in the eradication of cultivated black currants in our northwestern states. This work will be completed in northern Idaho, northeastern Washington and northwestern Montana this year. The absence of these most active intermediary host plants will prevent long jumps and retard the progress of the disease into the Inland Empire pine region of the United States, but will not prevent its slower spread through the medium of wild currants and gooseberries adjacent to the international boundary. Destroying the cultivated black currants is the first effective step in controlling the disease. The second step is the systematic protection of pine stands through Local Control.

Local control of white pine blister rust is only possible because of the fact that the disease cannot spread directly from an infected to a healthy pine, but must, by means of an intermediary stage, first attack currant or gooseberry plants. The currants or gooseberries are thus necessary in the life cycle of the disease. If they are removed the disease cannot spread. To locally control the disease, we therefore uproot all currant and gooseberry plants in and adjacent to the white pine stand. The general plan of work is to first protect the most valuable white pine timber in the extreme northern part of the Inland Empire. While it is impossible to exactly forecast the direction of spread of the infection in eastern British Columbia it is reasonable to suppose that it will steadily progress in a southern direction through the channels formed by the valleys of the Arrow and Kootenay Lakes, until it reaches the United States.

The Office of Blister Rust Control has carried on local control work during this season on the Priest River Experimental Forest, near Priest

River, Idaho. On this area, the white pine forest on the Benton creek drainage was protected from blister rust, the work then being discontinued because of shortage of funds. In addition, however, control reconnaissance surveys are being made on the Kaniksu and Pend Oreille National Forests, near the international boundary, in Idaho and Washington. This work is in preparation for more extensive local control to be carried on in 1924.

The cheapest and most effective way yet devised to remove these plants is to pull them up by hand. Where they are abundant, the men work in crews, carefully covering the ground to find all the bushes. In places where they are scattering the men can be spaced farther apart. In open ground where there are few plants to be pulled, an area can often be most cheaply covered by a single man.

It is obvious that the crew work will be quite expensive per acre or per thousand board feet of white pine on areas where wild currants and gooseberries are abundant. On the other hand, the cost will be slight on those areas where a single man can efficiently cover a large acreage in a day. Fortunately for such control work, wild currants and gooseberries are quite exacting as to conditions under which they will grow. In general, they will be found in great abundance only where there is considerable available soil moisture; along streams, in springy places, or at the base of rock ledges, where ground water comes to the surface. These conditions will be found on a relatively small part of any extensive stand of white pine. On the greater portion of such an area the cost of local control will be slight, and the average cost over the entire area will not be prohibitive.

Careful planning of such work is of great importance in doing it cheaply. To do efficient work, we must know before starting on a given area just what parts are to be worked by crew and what parts by men working singly. To determine these things, it is necessary to send a control reconnaissance party over the ground in advance of the local control crews. By cruising methods, the control reconnaissance party determines the value of the white pine on the area, the number of currant and gooseberry plants per acres on all parts of the area, and the occurrence of any factors such as windfall, heavy brush, or very rough ground that will tend to increase the cost of local control. From the information obtained by this survey, an estimate can be made on the cost of local control.

While this work is now on a practical basis, every operation is at the same time being considered from the experimental point of view. Every possible effort is being constantly made to decrease the cost. In this way methods will be worked out whereby it will be financially feasible to protect large areas of white pine from blister rust.

Very truly yours,

/S/ Stephen N. Wyckoff
Pathologist, In Charge Western Office,
White Pine Blister Rust Control

Exhibit 2

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Blister Rust Control

428 New Post Office Bldg.
Portland, Oregon
August 18, 1923.

Dear Sir:

White pine blister rust is in the West to stay, - its known distribution leaves no doubt about that. The disease connot be eradicated, but can be controlled. However, it is necessary to be armed with a detailed knowledge of the behavior of the disease under western conditions, if it is to be controlled at a practical cost. Much is known of conditions in the eastern United States, but here everything is different. By well planned investigative work time and money can be saved in applying control measures fitted to western conditions. The object is to work out the cheapest possible methods that will protect pine and this can only be done if based on a fundamental knowledge of the disease.

Based on present knowledge of blister rust in the West, the lines of investigation of most immediate necessity for intelligent action on control and the work being done on each are as follows:

1. Relative susceptibility of currants and gooseberries to infection. Plots have been established at Qualicum Beach and Daisy Lake, British Columbia, containing all the important native species of currants and gooseberries from the western white and sugar pine regions while in addition many of the species of minor importance are included. At Qualicum Beach the plants are being artificially infected with the disease, but at Daisy Lake they are being naturally infected only, from heavily diseased western white pines nearby. Furthermore, the same species are being tested under optimum conditions for infection in a greenhouse at Washington, D.C., thus giving a triple check on the results. Data on relative susceptibility are essential for proper control work, since the more susceptible the species of currant or gooseberry the greater its capacity for damaging pine and spreading the disease.

2. Distance of spread and rate of spread of the disease. Meteorological data, particularly wind movement and rainfall, for the five-needle pine regions of the Pacific slope are being analyzed

in relation to spread of blister rust. This analysis gives promise of explaining much concerning the past and future spread of the disease. In connection with the foregoing work strong circumstantial evidence is accumulating that the disease may spread great distances from pines to currants and gooseberries. This is one of the vital points, but at the same time one of the most difficult to determine.

3. Overwintering. Work is continuing to determine to what extent, if at all, the disease lives over winter on currants and gooseberries. This is of importance in the spread and establishment of the disease.

4. Damage to western white pine. Damage to individual trees is being determined by studying the growth of cankers from year to year, and damage to stands is being followed by means of yearly measurements of permanent sample plots. Studies under existing field conditions are being made on all species of currants and gooseberries possible to determine to what extent each species is capable of damaging pine.

5. Natural barriers to the spread of the disease. A preliminary reconnaissance has been completed in northern California to learn if it is advisable to make a detailed survey to determine whether a natural barrier exists or an artificial barrier can be created to prevent the spread of the disease into the major portion of the sugar pine in California.

Very truly yours,

J. S. BOYCE

Pathologist

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Seattle, Washington
June 16th, 1923

Blister Rust Control

Dear Sir:

At the close of the 1922 season, the various agencies which were scouting for white pine blister rust found that it occurred on currants and gooseberries, principally on cultivated black currants, throughout the Puget Sound region of Washington as far south as the Columbia River. The disease was also found to be established on pines, currants, and gooseberries in eastern British Columbia, in the region of Revelstoke and Beaton westward to Canoe and Salmon Arm (about 100 miles north of Idaho).

This indicates that the disease is progressing southward along the coast toward the sugar pine areas of southern Oregon and California, and that it is already in the region of eastern British Columbia, in the white pine forests, the southern part of which is continuous with the great merchantable stands of the Inland Empire.

The rust may be expected to reach the western white pine forests of the Inland Empire within the next five to ten years. Advantage must be taken of the present time to assure protection of the commercial white pine stands. There is only one way to do this - to clear this pine land of all currants and gooseberries. This work, like fire protection, cannot be done in one year. The area is large, and a trained and efficient organization must be built up which can carry on the work on a large scale. But to be effective, the work must be done before the disease becomes prevalent in the Inland Empire.

The weak point in the life cycle of the blister rust is, of course, the stage on the currants or gooseberries. The disease cannot spread directly from one pine to another, but must pass through an intermediary stage on currant or gooseberry leaves. This is the reason that the destruction of currant and gooseberries in the white pine forests protects the timber. The life cycle of the disease is in this way broken, and it cannot infect the pines.

The work which has been considered to be of greatest immediate necessity, and is, therefore, being carried on this year, falls under the following headings:-

1. Enforcement of federal and state blister rust quarantines, to prevent the artificial spread of the disease. During the 1923 spring inspection season 91 violations of these quarantines were intercepted.

2. Eradication of the cultivated black currant, the most active agent in the natural spread of the blister rust. Field parties are now engaged in this work in western Oregon, northeastern Washington, Idaho and western Montana. It is expected to have the commercial western white pine territory free from cultivated black currants by the end of this field season. This work on the southern edge of the white pine range should be completed in 1924.

3. Local control work in the Inland Empire. This consists of uprooting all wild currants and gooseberries in the white pine forests, thus breaking the life cycle of the disease, and preventing its spread. It is planned to begin this work in the extreme northern part of the Inland Empire, working southward in advance of the disease. The local control work now in progress on the Kaniksu National Forest will have to stop July 1st because of lack of funds. Advantage should be taken of the time before the disease reaches the Inland Empire from British Columbia to clear as much of the best commercial pine area as is practicable.

4. Investigative work on the life habits of the fungus. Exact information on its habits under western conditions is necessary in order that we may intelligently fight it.

At this time I only wish to indicate to you in a general way our plans for this season. Later I hope to write to you again, explaining in more detail how each part of the work is actually carried on. From this general statement, however, you can see that our field parties will be working in a number of localities in the West, during the summer. It may be that you can assist them in their work, and your help will be greatly appreciated. Any of them will be glad to receive information on the location of any cultivated black currant bushes. If you find any white pines, currants, or gooseberries which seem to be infected with blister rust, please send them to us for examination. Also, you can always help in the control of blister rust by discouraging the planting or growing of cultivated black currants in the West, and by refraining from the shipment of these plants or white pines in violation of the state or federal quarantines.

We are planning to move the western blister rust office to Spokane. After June 23rd, please address us at 624 Realty Building, Spokane, Washington.

Very truly yours

Stephen N. Wyckoff,

Pathologist, In Charge Western Office,
White Pine Blister Rust Control.

PROJECT 3

EXPERIMENTAL LOCAL CONTROL AND CONTROL RECONNAISSANCE IN THE WHITE PINE FORESTS OF NORTHEASTERN WASHINGTON, NORTHERN IDAHO, AND NORTHWESTERN MONTANA

Report on Local Control Project
PRIEST RIVER EXPERIMENT STATION,
Priest River, Idaho,
by
C. R. Patrie

During the spring and early summer of 1923, the Western Branch of the Office of Blister Rust Control conducted an experimental local control project on the Priest River Experiment Station maintained by the United States Forest Service, near Priest River, Idaho. The following is a report to cover this project.

1. Project

The purpose of this project was to (1) protect the standing white pine timber on an important area from damage by white pine blister rust in advance of the probable entry of the disease in the near future; (2) to investigate local control problems under western conditions in order to determine the necessary variations in methods, and to learn the probable maximum costs under the most adverse conditions. (3) To concentrate investigations upon those factors through which reasonable costs of local control can be developed.

The method employed in protecting white pine timber from white pine blister rust is to destroy all currants and gooseberries (Grossulariaceae) within and adjacent to the stand of timber to be protected. The removal of these plants breaks the life cycle of the causal organism of white pine blister rust (Cronartium ribicola Fischer) thus preventing the infection of the white pine. Such protection of definite white pine areas is known as local control. Under this method, actual work is confined to the immediate vicinity of white pine areas. Local control, therefore, is necessary only on present and potential white pine lands.

2. Area Protected

After conference with Mr. R. H. Weidman, Director of the Priest River Experiment Station, the Benton Creek drainage, on the Experiment Station, was chosen as a suitable area for this work.

The Benton Creek drainage consists of a valley extending in a general east and west direction, and is approximately 4½ miles long and ½ mile to a mile in width. The north and south slopes vary from approximately 30% to 80% in steepness.

Timber conditions on this area are approximately as follows:

Benches at mouth of valley - mixed stands containing an average of 5 M. bd. ft. white pine, 0 - 60 years old.

North slope - in the lower part of the valley supports growths of Douglas fir type and larch - Douglas fir type, 50-60 years old. Of the timber on the north slope of the middle and upper valley, 90% contains abundant white pine 50-100 years old, and 10% is Douglas Fir type 50-100 years old.

South slope - the lower and middle valley is principally yellow pine - Douglas fir type 0-150 years old, with a few small white pine areas 0-60 years old, 60% of the upper valley contains abundant white pine 50-60 years old, and 40% is Douglas fir type 50-60 years old.

The species of Grossulariaceae (hereafter referred to as Ribes) which occurred on this area were as follows:

1. Ribes lacustre. Generally distributed over the area. This species normally grows in a fairly moist but well-drained soil, as a rule preferring at least partial shade. It is, however, more dependent upon proper moisture than upon proper light conditions.

2. R. viscosissumum. This species is generally confined to relatively dry and well lighted sites. It occurred in considerable numbers along the upper slopes and ridges, particularly on the upper part of the north facing slope.

3. Grossularia inermis. Confined to a narrow belt along streams, in moist soils which tend to be poorly drained, and in at least partial shade. Under these limited conditions it grows luxuriantly and in great profusion, tending to climb among trees and other shrubs, and to propagate by layering. An area of about 3 acres situated south and southeast of the Experiment Station buildings on the Benton Creek bottoms had a very heavy growth of G. inermis. These bushes grew in such a tangled mass of vegetation that pulling was rendered very slow. From this area 11,000 bushes of G. inermis and probably 3,000 R. lacustre were pulled at a cost of about $743.40, or about $247.80 per acre. It was the most difficult type of eradication encountered in the Benton Creek drainage. This type is not common in the region, all reconnaissance work in extreme northern Idaho having revealed no other such area. Hence the cost can probably be considered abnormally high.

Organization

The local control crews started work on the project on May 19, 1923. Crew work was carried on from May 19th to June 30th inclusive. Scouting was done from June 16th to August 8th inclusive. During the 40-day period of crew work, it required a personnel of 18 men to keep 2 5-men crews in the

field. This high turnover caused a considerably increased cost. The two crew foremen had had about three months previous experience as members of such crews, one of the scouts had managed the 1922 black currant eradication campaign in western Oregon, and one of the recorders was an experienced blister rust man. The remainder of the personnel was entirely without experience. About a week of training is necessary to develop an inexperienced crew into a relatively efficient crew.

4. Methods of Work.

The most feasible and cheapest method yet developed for destroying Ribes is to pull them out by hand. In most cases the bushes can be quite readily and quickly pulled by one man. If the crown and the upper portions of the main roots are pulled out, the bush will not sprout again, whereas if the bush is cut off at the crown it almost invariably sprouts. After the bushes are pulled, they are hung in the surrounding brush or trees. If thrown on the ground they will often take root again.

The methods used in the actual work of destroying the Ribes on the area were largely in conformity with the methods perfected in the eastern states. Briefly, they are as follows:

1. Crew work: on those portions of the area where the Ribes occurred in profusion the men worked in crew formation. A crew normally consists of five men and a foreman. The crew works in a line, at right angles to their direction of progress, moving steadily forward, each man pulling the bushes on the strip assigned to him. The width of each man's strip, which is the distance of spacing between the men in line, was dependent upon the profusion of the Ribes and the density of brush cover. In areas of heavy Ribes growth, the normal distance between men was six feet. As the bushes were pulled, they were hung in the trees or brush, to allow proper drying out and killing.

2. Scouting: on those portions of the area where the Ribes were scattering, or where they occurred in profusion only in small patches of less than one acre in size, the scouting method was used. By this method either a wide strip or a given area was assigned to one man, he then being held responsible for pulling the Ribes on his strip or area. Or if the wide strip method was used the several men were held jointly responsible for the area covered.

5. Proportion of Area Covered by Crew and Scouts.

Of the total area of 1,698 acres protected on this project, 154.8 acres were covered by crew and 1,543.2 acres covered by scouts. The area covered by crew consisted of a belt, 100 to 400 feet in width, along Benton Creek from its source to Priest River, for a short distance

up the larger tributaries, and of a wider belt along the north ridge. The conditions on these sites were favorable for Ribes growth, and R. lacustre and G. inermis were found in profusion. The balance of the area protected was covered by the scouting method.

6. Results of Crew Work

The results of the crew work as related to actual pulling of Ribes are given in Tables 23,24 and 25, for the north facing and south facing slopes near Benton Creek, and for the additional crew work near the ridge on the south slope.

Table 23

Ribes Pulled by Crew, North Slope, Along Benton Creek

Species	% of Total Ribes	HEIGHT OF BUSHES						
		½ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft. & over	Total
R. lacustre	56.0	2,320	2,662	1,239	676	240	739	7,876
G. inermis	39.0	1,006	2,008	809	566	188	905	5,482
R. viscosissimum	5.0	225	144	153	72	29	79	702
Total	100.0	3,551	4,814	2,201	1,314	457	1,723	14,060
% of Total Ribes		25.3	34.2	15.7	9.3	3.2	12.3	100.0

Table 24

Ribes Pulled by Crew, South Slope, Along Benton Creek

Species	% of Total Ribes	HEIGHT OF BUSHES						
		½ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft. & over	Total
R. lacustre	62.6	2,465	2,968	2,367	1,364	533	1,047	10,764
G. inermis	36.6	1,007	1,924	1,382	867	302	827	6,309
R. viscosissimum	0.8	44	19	36	16	8	8	131
Total		3,516	4,911	3,785	2,247	863	1,882	17,204
% of Total		20.4	28.5	22.0	13.1	5.0	11.0	100.0

Table 25

Ribes pulled by crew, South Slope, near top of Ridge.

Species	% of Total Ribes	HEIGHT OF BUSHES ½ ft.	1 ft.	2 ft.	3 ft.	4 ft.	5 ft. & over	Total
R. lacustre	99.5	1,322	2,618	2,388	2,179	1,155	2,251	11,913
R. viscosissimum	0.5	28	10	9	3	4	7	61
Total		1,350	2,628	2,397	2,182	1,159	2,258	11,974
% of Total		11.3	21.9	20.0	18.2	9.7	18.9	100.0

Tables 23, 24 and 25 show a total of 43,238 Ribes pulled by the crews. As the crew work was confined to 154.8 acres, an average of 279.3 Ribes was pulled per acre.

7. Results of Scouting Work.

The scouting work as carried on in this project resulted in the Ribes being pulled as follows:

Table 26

Ribes pulled by scouts, both slopes.

R. lacustre	8,428
R. viscosissimum	1,663
G. inermis	226
Total	10,317

Table 26 shows a total of 10,317 Ribes bushes pulled by the scouts. As the scouting work covered 1,543.2 acres, an average of 6.7 Ribes per acre occurred on this ground.

8. Cost.

The cost of the local control work on the Benton Creek drainage was $3,196.64. This figure includes all costs properly chargeable to local control as carried on on a practical basis. It does not include the salaries, transportation, or proportional charge for board for the several men engaged in purely experimental work, to determine if the methods

used where the most feasible and cheapest. Such work is not a normal part of the local control costs. Out of a total of 924 man days employed on the entire project, 150 man days were devoted to this experimental work, leaving 774 man days properly chargeable to local control. The figures given in the following tables are based on the 774 man days properly chargeable to local control, except as specifically noted:

Table 27

Cost of Eradication

Class of Work	Work in Field		Rest Period		Rain		Walking to & from work		Misc. Travel etc.		Cost	
	Man Hours	Cost	Man Hrs	Cost	Man Hrs	Cost	Man Hrs	Cost	Man Hrs	Cost	Man Hours	Cost
Supervision	296	$ 264.92									296	$ 264.92
Crew Work	1,767	1,263.42	47	$33.60	555	$396.84	243	$173.75	604	$431.86	3,216	2,299.47
*Scouting	147						29		164			
	439½				48		9½					673.78
	586½	442.81			48	38.64	38½	29.06	164	132.02	837	
		$1,971.15		$33.60		$435.48		$202.81		$563.88		$3,238.17

*Top row figures show no. hours scouting before July 1, bottom row show no. hours scouting after July 1.

Table 28

Cost of Local Control, per Acre

Type of Work	Cost (Table 5)	Proportional Charge Field Supervision	Total Cost	Acreage	Cost Per Acre
Crew work	$2,299.47	$202.90	$2,502.37	154.8	$ 16.16½
Scouting Work	673.78	62.34	736.12	1,543.2	.48
Total	$2,973.25	$265.24	$3,238.49	1,698.0	$ 1.91

Table 29.

Labor Data.

Class of Work	Man Days Employed	Man Working Days	Man Working Hours	Salary	Rate per Man Hour	No. Men Employed
Cook and Kitchen Help	97	97	776	$ 314.40	.40	2
Supervision	43	37	296	175.00	.59	1
Crew Work	483	402	3,216	1,319.19	.41	12
Scouting	164	104	837	420.44	.48	2
Recording	137	118	944	477.17	.50	2
Total	924	758	6,069	2,706.20		19

Total number of days of field work (cook and kitchen excluded)-661 days, 5,293 man-hours with total cost of $2,391.80.

Table 30
Cost of Board*

Pay for Cook and Helper	Cost of Food and Equipment	Transportation of Food and Equipment	Total Cost	Total Man-days on Project	Cost of Board per Man-day
$314.40	$1,042.99	$80.24	$1,437.63	924	$1.55

*These figures are for the entire project, including experimental work.

Table 31.
Rate per Hour

Class of Work	Rate of Salary per man hour for number of working days in field	Rate of board per man hour for working days in field	Rate per Hour for transportation etc., for working days in field	Total cost per man-hour based on working days in field	Total cost per Working day
Supervision	$.59	$.26 2/3	$.04	$.89 1/2	$7.16
Crew	.41	.26 2/3	.04	.71 1/2	5.72
Scouting	.50	.26 2/3	.04	.80 2/3	6.44
Recording	.50	.26 2/3	.04	.80 2/3	6.44

9. Areas Set Aside for Future Work

Due to the fact that the appropriation for western blister rust control work was limited during the fiscal year of 1924, the entire Benton Creek drainage was not completed. About 320 acres of intensive scouting situated in the upper part of the drainage, and mostly on the north facing slope, remains to be done.

10. Summary

1. The Western Branch of the Office of Blister Rust Control carried on during 1923 an experimental local control project on the Priest River Experiment Station. The purpose of this project was to protect the white pine timber on the area from blister rust, and to experimentally determine the cheapest and most feasible methods of work.

2. The area chosen for this project consisted of the Benton Creek drainage on the Priest River Experiment Station.

3. On this area, 1,698 acres were protected from blister rust. Of this, 154.8 acres were worked by crew, and 1,543.2 acres by scouts.

4. The total cost of the actual local control project was $3,196.64. The average cost per acre of crew work was $16.16⅔. The average cost per acre for scouting work was $.48. The average cost for the entire area was $1.91 per acre.

5. Because of shortage of funds, the entire Benton Creek drainage was not protected. About three hundred and twenty acres of intensive scouting were set aside for the future.

1923 CHECK ON CENTRAL IDAHO ERADICATION AREAS

The crew work on these several areas shows to have been fairly efficient, considering the inexperience of the entire force. Carelessness is very evident.

The scouting in these areas was all very low in efficiency, while several of the areas have zero efficiency. The results of the scouting show very poor judgment, for in not one instance was enough time charged up to the scouting of an area to know whether the area contained Ribes, and, if so, how many.

In scouting, the ground simply was not sufficiently covered. They believed there were no Ribes there, and so did not go over the ground to look. The 1922 inspection of the scouting eradication (Patrie stated that he checked 10 acres in the south part of Block 4, Elk River) shows overconfidence and carelessness.

The tabulated results of the 1923 check, compared to the 1922 eradication, are presented herewith.

Alder Creek Area

Patrie states that 75 per cent of Ribes viscosissimum was defoliated at time of eradication.

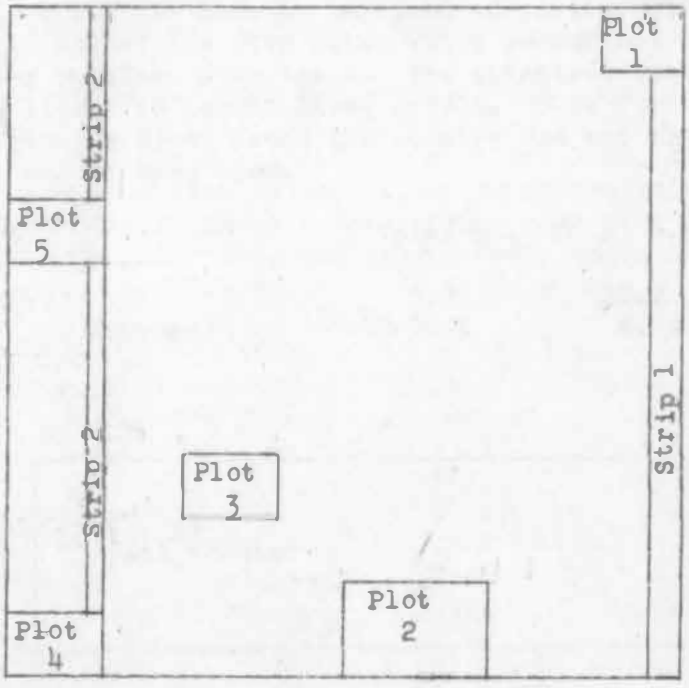
Logging early the present year has disturbed the natural conditions, and has probably left some Ribes more open than under the natural conditions. It has also undoubtedly killed some of the missed Ribes by mechanical destruction. The 1922 scouting on this block was not sufficiently intensive nor sufficiently careful. In Plot 2, it was noted that where many Grossularia irrigua were pulled in 1922, many others were left, and it was apparent that, in pulling, the men had thrown the bushes beside them, covering some of the unpulled bushes, and these were thus missed.

The crew work shows much greater efficiency than does the combined crew and scouting work.

This block shows missed Ribes in all parts of the block except in the portion along the east side which is marked on the accompanying sketch as Yellow Pine Type. I believe this type had no Ribes before eradication. The Ribes appear to have a general distribution elsewhere.

From Patrie's statement, it would seem that eradication should never be undertaken after defoliation has begun. Except for the defoliation factor, carelessness is the chief cause of low efficiency in this block.

Patrie states that they hurried the scouting of this block, in order to complete the area on a certain day. The cost records show that the scouting of the block was not of sufficient length of time to know what was in the block.



Alder Creek Area

Erroneous statement in report: The southeast corner of this block is marked S.W. Cor. The northwest corner is also marked S.W.Cor. The block is surveyed with a variation of N 33° to 34° E instead of N. 23° E.

Although yellow pine is not mentioned in the report, about one-fifth of the block (the east edge) is this type.

Bovill Area

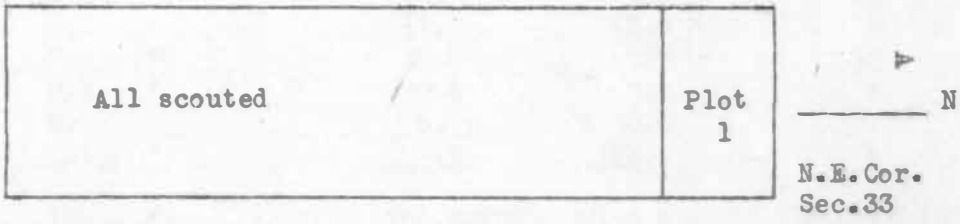
The scouting work in general was too extensive and too much was taken for granted in working the same.

Block 1.

This area was worked entirely by scouting and no Ribes were found in 1922. In 1923 check, five Ribes were found in a check on 1 acre. A walk lengthwise through the plot following this check revealed three additional Ribes. I believe this acre check to be typical of the block.

This check was made by parallel adjoining strips approximately 20 feet apart. All of the five Ribes which were found were on dirt piles thrown up by blown over trees. The slightest opening in the timber cover appears likely to permit Ribes growth. This fact was not realized by the 1922 scouting crew, hence the country was not as intensively covered as it should have been.

Plot 1	Total Ht.	Total L.S.	No. Ribes
1.0 acre	9.2	23.2	5
Average	1.84	4.64	



Only 1.25 man hours are charged against the scouting of this 10 acres, which is not enough time to know the Ribes content of the heavily thicketed area such as this is. Dense mixed reproduction prohibits seeing the ground without going through it.

In eradicating such ground, the slightest thinning in the dense reproduction must be suspicioned and searched carefully.

Table 32

	Species	No. Bushes Per Acre	Av. Ht. Bushes	Total L. S. Per Acre	Degree Concealment			
					Heavy	Med.	Light	Open
1922 Eradication	R. vis.	0	0	0	0	0	0	0
	R. lac.	0	0	0	0	0	0	0
1923 Check	R. vis.	0	0	0	0	0	0	0
	R. lac.	5	1.84	23.2	2	0	0	3
% Efficiency, 1922 Eradication		0.0	0.0	0.0	0.0	0	0	0.0

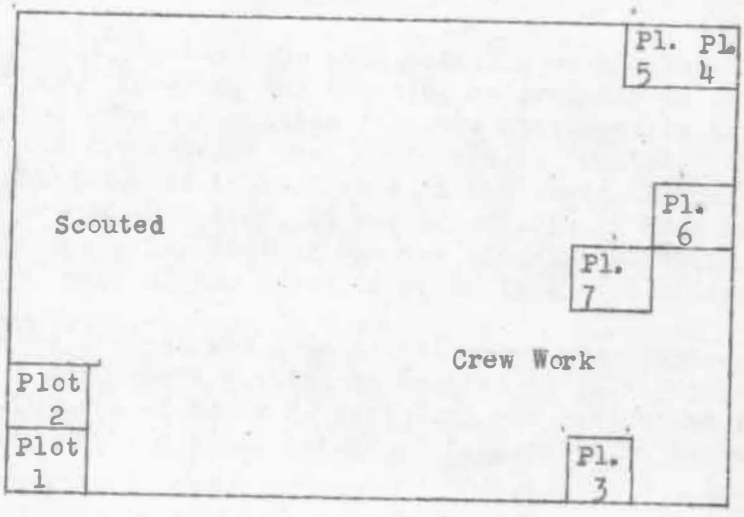
Block 2

Approximately 72.5 per cent of this block was scouted and 27.5 per cent was worked by the crew.

Taking too much for granted, and hence working too extensively, was the chief trouble with the scouting of this area. The 14½ scouted acres are charged with but 2 hours 25 minutes man hours of scouting time, which is not sufficient time to know the ground. One cannot cover 1 acre of this ground by strips 16 feet apart, in less time, due to the heavy underbrush.

Table 33

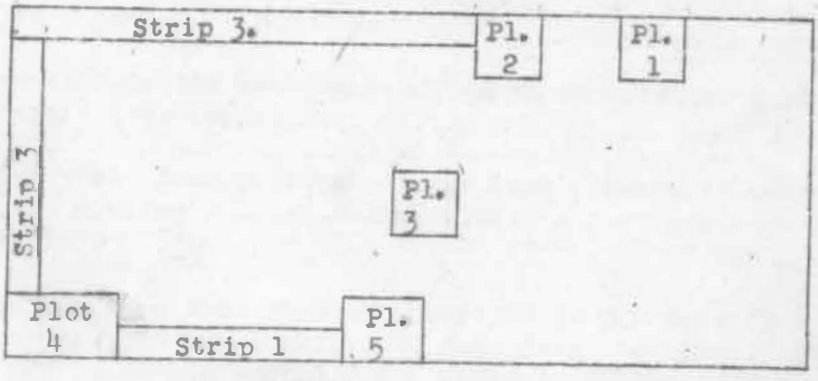
		Total Ht.	Total L.S.	No. Ribes
Plot 1	0.5 acres	12.0	58.0	2
" 2	0.5 "	33.5	123.0	15
" 3	0.1 "	37.5	142.0	9
" 4	0.1 "	50.0	68.2	32
" 5	0.1 "	9.0	9.0	8
" 6	0.1 "	6.0	6.5	4
" 7	0.1 "	9.2	11.2	7
	1.5 "	157.2	417.9	77



S. W. Cor.
Sec. 27.

- - - - - - - - - - - -

Block 3.



BOVILL BLOCK 3

The 1923 check on the 1922 scouting work within this block revealed no Ribes. However, the scouting is probably no better than in the other blocks. The explanation for this statement is that the boundaries of the crew-worked area could not be located. Since the Ribes found by the scouts in 1922 were on the lower slopes immediately adjoining the crew-worked area, it was impossible to know by a check in that portion of the area, whether one was checking scouting or crew work. The upper (west) part of the block is probably almost Ribes-free.

On the crew-worked area missed Ribes are common. Missed R. petiolare occur everywhere within the habitat of this species. An area of probably 1/10 acre of heavy R. petiolare was overlooked in eradicating this block. Only a small corner of this patch is included in the check.

1923 CHECK

ELK RIVER BLOCK 1

This area was eradicated and re-eradicated by a crew in 1922, and was checked over by means of 16-foot strips in June 1923.

Carelessness and overconfidence were the leading causes of missed bushes. In-experience of members of the party was a contributing factor. Since the efficiency of the personnel was not materially higher at the last of the season than in the earlier part of the season, in-experience cannot be regarded as a leading cause. It appears likely that site may be a factor of some importance.

Ceanothus is the leading shrub in which Ribes were missed. Acer and Salix were less important.

Relaxation after pulling a large bush appears to have been a heavy factor in missing smaller bushes within a few inches or feet distance.

(The report states that the hospital is 200 feet from the corner of the block. It is actually 430 feet from the block. Also no mark is evident upon the ground for a stranger to locate the area. Several boundary lines of the block are not plotted correctly on the map, accompanying the report, the map measuring 17.5 acres, in place

of 15.5 acres as stated in the report.)

Ribes viscosissimum sprouts, or "suckers", from the root crown of 7.5 per cent of the eradicated bushes were found to be growing thriftily in June, 1923. These were almost all from bushes which had been cut off near the surface of the ground by the 1922 crews. The details of this study are shown in the separate table.

The extension to Elk River Block 1, the report states, was added to compare the costs of green and inexperienced crews. No comparison is possible here, for the two units are so dissimilar that any figures for one area are not applicable to the other. It appears that the primary reason for adding this extension, was to lower the per acre cost of eradication for the block. Altho the extension was eradicated after the crew had a month's experience, the check shows no marked change in the efficiency of the crew.

Table 34

No. Bushes Found 1922 on Original Block	No. Bushes Found 1923 Check on Original Block 1	% Efficiency
2450	767	76.2

No. Bushes Found 1922 on Extension Block 1	No. Bushes Found 1923 Check on Extension Block1	% Efficiency
137	37	78.7

The report states that a six foot strip per man was usually taken on this block, because the Ribes and brush were heavy. During the 1923 check a 16-foot strip was taken throughout the entire block. Numerous Ribes were also undoubtedly missed during this 1923 check. The 1922 eradication should have averaged between 10 and 12 feet width of strip per man.

ADVANCE PLOTS 1-2-3
Block 1, Elk River

All brushy and herbaceous growth, including Ribes, were listed separately for each plot preceding eradication by the crew. The crew did not know the location of these plots, hence each plot received only average attention by the eradication crew. Following eradication, these plots were again checked over to locate Ribes bushes which had been missed by the crew. These checks before and after eradication were made by Patrie, and he reported that eradication on the plots had been 100 per cent efficient, and that no Ribes remained.

The results of the 1923 recheck on these advance plots are given herewith:

Table 35

PLOTS 1-2-3 BLOCK 1 ELK RIVER, IDAHO
1923 CHECK ON 1922 RIBES ERADICATION

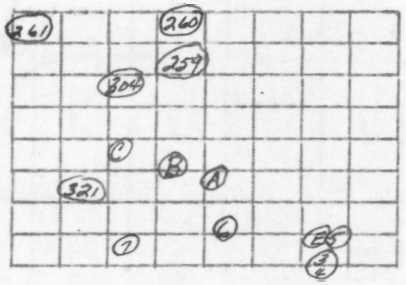
1923 CHECK

Plot No.	No. Missed Ribes	Total Ht.	Total L.S.	Av. Ht.	Av. L.S.
1	9	7.3	7.8	0.81	0.87
2	3	1.2	1.2	0.4	0.4
3	18	10.2	21.1	0.57	1.16
Total 1923	30	18.7	30.1	0.62	1.00
Total 1922				2.51	8.25

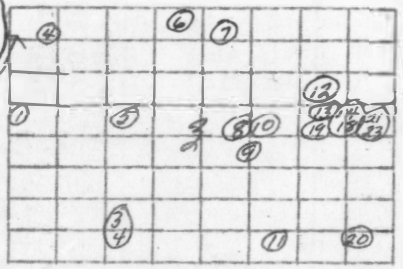
1922 ERADICATION

Plot No.	No.Ribes 1922 Eradication	L. S. 1922 Eradication	No.Ribes 1923 Check	Old L. S. 1923 Check	No.Ribes % Efficiency	L.S. % Efficiency
1	40	161.13	9	7.8	81.6%	95.3%
2	7	106.38	3	1.2	70%	98.8%
3	45	492.44	18	21.1	71.4%	95.8%
Total	92	759.95	30	30.1	75.4%	96.1%

1923 Check
Elk River Block 1.
Advance Check Plots.



Mapped as 1.3 chs. S. of SW Cor. Plot 2. Actually 1.1 chs. S. of SW Cor. Plot 2.



Scale 2" = 1 chain.

Table 36

RECHECK OF PLOT 1 - BLOCK 1

ADDITIONAL RIBES FOUND

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	SPECIAL NOTES
A	R. vis.		0.4	0.2	0.5	0.2	Open	(S.) Opening in brush
B	R. vis.		0.6	0.3	0.6	0.3	Open	(SW.) Opening on N. side of stump
E	R. vis.		0.5	0.5	0.5	0.5	Light	(S.) In very open brush at S. edge of trail.

RECHECK OF PLOT 2 - BLOCK 1

NO ADDITIONAL RIBES FOUND

Table 37

RECHECK OF PLOT 3 - BLOCK 1

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	SPECIAL NOTES
1	R. vis.		1.8	1.0	3.5	2.0	Light	(none) In opening in brush
3	R. vis.		0.5	0.4	0.5	0.4	Light	(S.) Opening between Salix & W. P.
4	R. vis.		0.2	0.1	0.2	0.1	Medium	(S.) Opening between Salix & W. P.
5	R. vis.		1.0	0.8	1.0	0.8	Heavy	(All I) In large Salix clump 3' NE. of stump
6	R. vis.		4.0	3.5	15.0	12.0	Heavy	(All I) In large Salix clump 3' NE. of stump

RECHECK OF PLOT 3 - BLOCK 1 (Continued) 1.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	SPECIAL NOTES
7	R. vis.		0.4	0.2	0.4	0.2	Heavy	(All-½ Under heavy mixed brush
9	R. vis.		1.6	0.8	2.5	0.8	Open	(None) Large open space 2' E. of 5' W. P.
11	R. vis.		2.0	1.3	6.0	2.5	Light	(None) Opening 7' NE. of white stump.
14	R. vis.		0.8	0.2	0.8	0.2	Medium	(None) 12" - 18" vegetation
15	R. vis.		0.8	0.6	1.0	0.8	Medium	(None) 12" - 18" vegetation
16	R. vis.		0.3	0.1	0.3	0.1	Medium	(None) 12" - 18" vegetation
17	R. vis.		0.6	0.2	0.6	0.2	Medium	(None) 12" - 18" vegetation
18	R. vis.		1.0	0.4	1.0	0.4	Light	(S.) With small Salix in open
20	R. vis.		0.8	0.3	1.0	0.3	Medium	(S.) Broken off 2 yrs. ago (old bush).
21 to 23	R. vis.		0.3	0.1	0.3	0.1	Medium	(All-½) 12" - 18" vegetation
24	R. vis.		0.6	0.2	0.6	0.2	Medium	(All-½) 12" - 18" vegetation

Elk River Block 2

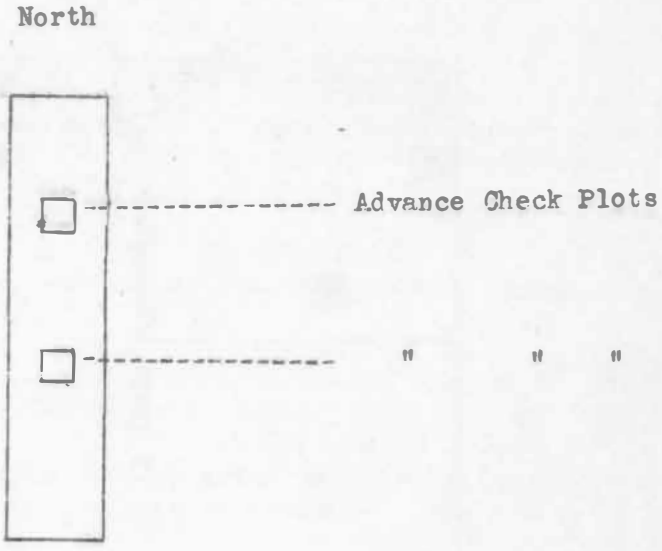
Twenty-five per cent of the block checked (3 acre check). This area was scouted (1922) too extensively. The records show only 1½ hours charged to the eradication of 12 acres (entire block), and this is not sufficient time to know the ground.

The ground simply was neither scouted nor eradicated in 1922.

Table 38

1923 Check on Block 2 Elk River, 1922 Idaho Eradication Area

	Species	No. Bushes Per Acre	Av. Ht. Per Bush	Total L.S. Per Acre	Degree Concealment			
					Heavy	Med.	Light	Open
	R. vis.	0.17	This data not taken					
1922 Eradication	R. lac.	0.08	" " " "					
	Total	0.25						
	R. vis.	4.33	2.99	193.2	0.0	0.67	1.67	1.33
1923 Check	R. lac.	-	-	-	-	-	-	-
	Total	4.33	2.99	193.2	0.0	0.67	1.67	1.33
	R. vis.	3.8	-	-	-	-	-	-
% Efficiency	R. lac.	100.0	-	-	-	-	-	-
1922 Eradication	Total	5.5	-	-	-	-	-	-



About 2 acres were checked in the center of the block, and one acre near the south end of the block.

The advance check plots of Block 2 were very poorly chosen. Both are situated on as level, and as open, ground as is within the block. No steep slopes, and no heavy brush, are within the plots.

It is inconceivable how the two advance check plots could have been laid out without seeing some of the large Ribes bushes within 45 feet of Plot 1, and other Ribes which are generally distributed between the two plots.

The check plots contain no Ribes in 1923. The 1922 report states "No Ribes on the Plots."

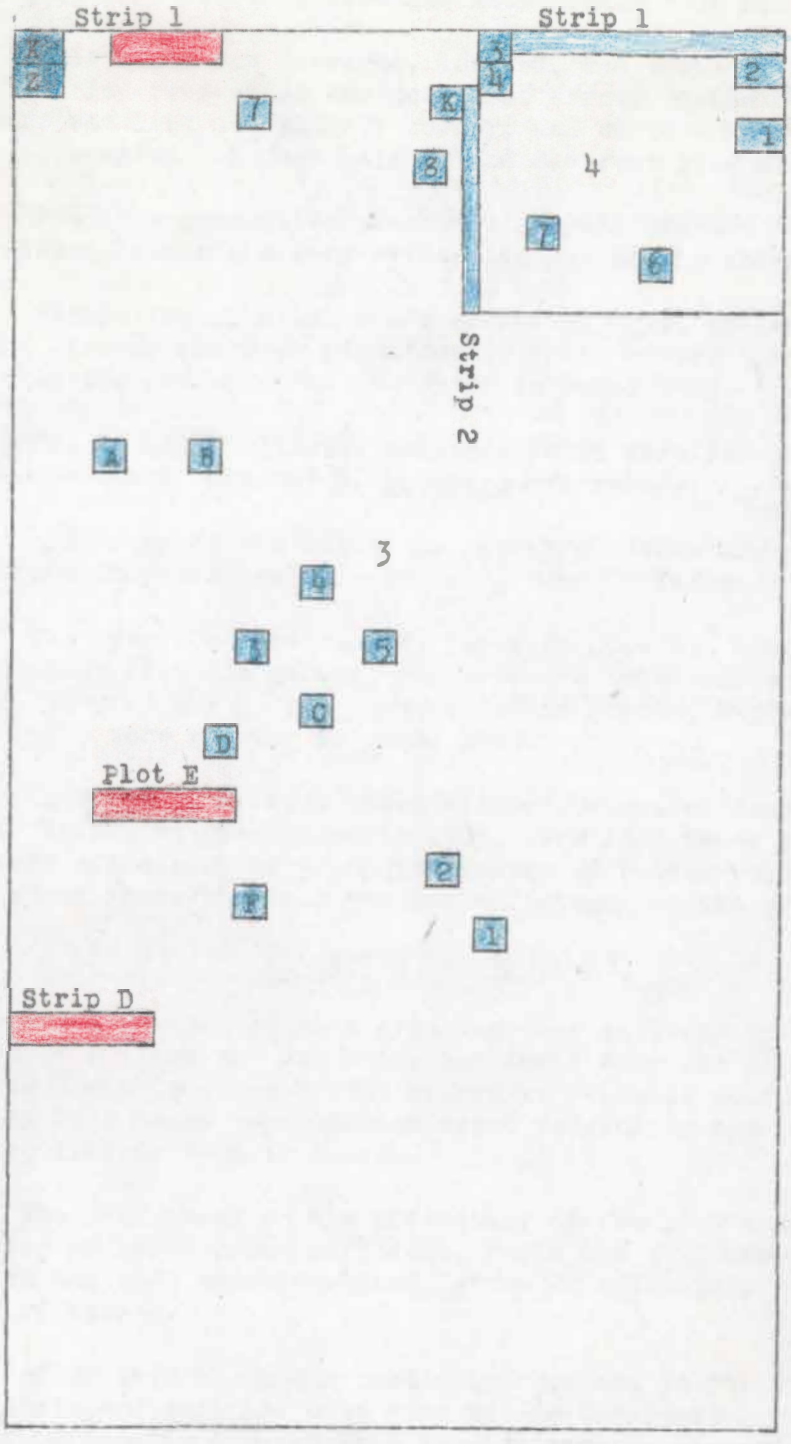
ELK RIVER BLOCK 3

Patrie states that crew work reached maximum efficiency in this block. Due to the prevailing rainy weather, which was encountered at the time the check was made, it was impracticable to make a strip check of this area. It was intended to make such a check of this block.

Very poor judgement was used in delimiting the crew work in this block. It would appear that the marker of these lines had been told that these painted lines should be placed 10 feet above the creek level, or possibly a certain distance back from the edge of the alluvial bottoms. One line (e.g. 4 chains east of northwest corner of block) has been marked through a patch of R. lacustre, instead of around it, with dense Ribes bushes just outside the crew area which were later missed by the scouts. Common sense should have told the marker to go around all Ribes areas.

1923 Check

Elk River Blocks 3 & 4



Scale 1" = 10 Chains

Crew Checks

Scounting Checks

"Missed" Ribes occur in all parts of the block. The percentage of efficiency for crew work averages much higher than for scouting work.

This block was surveyed, located, and worked from the land office corner which is situated at the northwest corner of the block. A half acre square was laid out in this corner, and on this half-acre 84 R. lacustre, averaging 1.9 feet height, and 8.4 feet live stem per bush.

The fire protective association trail crosses this half acre, and the missed bushes are very evident to anyone who knows Ribes.

Within the alluvial areas worked by crew, pulled R. petiolare bushes are growing wherever the stems or roots of the plants pulled in 1922 were on the ground or in the water in June, 1923.

The areas of alluvial bottoms, which were eradicated in 1922, show numerous small "missed" R. lacustre everywhere.

Also many of the pulled R. lacustre bushes are growing again in 1923 where they are touching either ground or water.

The report states that R. lacustre does not sprout rapidly when in contact with the ground, but evidence this year was to the contrary. Many of the R. lacustre pulled in August, September, and October, 1922, were growing in June, 1923.

In block 3, advance check plot #7, situated near the cabin beside Elk River, was rechecked in 1923. The 1922 check on this plot records efficiency of 98.8% for number of bushes pulled while the 1923 check shows but 66.2 percent efficiency on the same basis.

ELK RIVER BLOCK 4

The 1922 work on this area was done entirely by scouts. The scout covered 6 acres per man hour, and found very few of the Ribes. Part of the block is shown by the report to be an 11 year burn. This area really is a heavy reproduction stand varying in age from 30 to 40 years. The 11-year burn is a myth.

The 1922 check on the efficiency of the 1922 eradication shows the scouting as 100 percent efficient, while the 1923 check on the 1922 eradication and 1922 check combined, gives an efficiency of 16.2 percent by number of bushes.

After this block was partially checked, Patrie visited the block, and said that good work had been done in the Southwest quarter of the block, for he had personally checked that 10-acre square. Accordingly, .325 acre was checked near that corner of the block, and efficiency of Patrie's check was found to be zero.

In the 1922 work, only R. viscosissimum was found on the block, but R. lacustre is also common.

The upper slope type is reported as having no Ribes, but R. viscosissimum and R. lacustre are both quite common on this type.

The 7-year burn is reported as Ribes free, but R. viscosissimum are common there. R. lacustre is also seen occasionally.

GENERAL COMMENTS

The report states that all block boundaries are blazed fore and aft and facing the area. These blazes are usually very few and small. The boundaries generally cannot be followed without the aid of the compass. Some of the block boundaries were never blazed.

An important factor in the efficiency of eradication was noted during the progress of this check. Almost every bush which was pulled, had been dragged to the gound by the winter snows, and many of the bushes (which had generally been hung in the brush in 1922) were growing in June, 1923. Only occasional bushes remained on the flat tops of stumps. Practically all other bushes had gone down with the settling snow. No pulled R. viscosissimum which had again started to grow, were observed.

The efficiency of crew eradication shows no improvement during the season. Scouting was equally inefficient at the beginning and at the close of the working season.

* * * *

The following tabulations give all detailed information which was secured concerning the Ribes bushes missed on the several blocks.

Table 39

ALDER CREEK - BLOCK 1 - 1923 STRIP 2 - 0.1 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S. June 1923	Ft. L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	1.0	0.2	3.0	0.2	Open	
2	R. vis.	2.0	1.5	5.0	3.0	Open	
3	R. vis.	2.5	1.5	5.0	2.0	Open	
4	R. vis.	1.5	1.0	2.5	1.0	Open	
5	R. vis.	1.5	1.0	2.5	1.5	Open	
6	R. vis.	1.0	0.3	1.0	0.3	Open	
7	R. vis.	1.0	0.2	1.0	0.2	Open	
8	R. vis.	2.0	1.0	2.0	1.0	Open	
9	R. vis.	3.0	3.0	15.0	15.0	Open	
10	R. vis.	2.0	1.5	5.0	3.0	Open	
11	R. vis.	3.0	3.0	18.0	16.0	Open	
12	R. vis.	1.5	0.5	1.5	0.5	Open	
13	R. vis.	1.0	0.5	1.0	0.5	Open	
14	R. vis.	1.0	0.5	1.0	0.5	Open	
15	R. vis.	5.0	4.5	20.0	18.0	Open	
16	R. vis.	4.0	4.0	14.0	12.0	Open	

ALDER CREEK - BLOCK 1 - 1923 STRIP 2 - 0.1 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
17	R. vis.	2.0	2.0	3.0	3.0	Open	
18	R. lac.	2.5	2.5	10.0	9.0	Open	
19	R. vis.	5.5	5.0	40.0	38.0	Open	
20	R. vis.	5.0	5.0	20.0	20.0	Open	
21	R. lac.	1.0	1.0	1.0	1.0	Open	
22	R. lac.	3.0	3.0	20.0	20.0	Light	
23	R. lac.	0.5	0.1	0.5	0.1	Open	
24	R. vis.	1.0	1.0	3.0	3.0	Open	
25	R. vis.	1.0	1.0	1.0	1.0	Open	
26	R. vis.	3.0	2.5	5.0	4.0	Open	
27	R. vis.	2.0	2.0	4.0	3.0	Open	
28	R. vis.	1.0	1.0	2.0	2.0	Heavy	
29	R. lac.	2.5	2.0	5.0	4.0	Open	
30	R. lac.	3.0	3.0	6.0	5.0	Open	
31	R. vis.	3.5	3.0	5.5	5.0	Light	
32	R. vis.	4.0	4.0	20.0	16.0	Open	

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
33	R. lac.	3.0	2.5	15.0	12.0	Open	
34	R. vis.	2.5	2.0	2.5	2.0	Light	
35	R. vis.	2.5	2.0	2.5	2.0	Light	
36	R. vis	2.0	2.0	2.0	2.0	Open	
37	R. vis.	1.5	1.0	1.5	1.0	Heavy	
38	R. vis.	1.5	1.0	1.5	1.0	Medium	
39	R. vis.	3.0	3.0	6.0	5.0	Light	
40	R. vis.	2.0	2.0	2.0	2.0	Open	
41	R. vis.	1.0	1.0	3.0	2.0	Open	
42	R. vis.	3.5	3.5	25.0	23.0	Light	
43	R. vis.	5.0	4.0	15.0	14.0	Medium	
44	R. vis.	0.6	0.2	0.6	0.2	Medium	
45	R. vis.	0.4	0.2	0.4	0.2	Open	
46	R. vis.	0.4	0.2	0.4	0.2	Open	
47	R. vis.	3.0	2.5	8.0	7.0	Light	

(1/8 x 8 Chains) NW. Corner is NW. Cor.Block.

ALDER CREEK -- BLOCK 1 - PLOT 1 - 1/10 ACRE

In NE. corner of Block. Corners coincide. No Ribes.
Timber Y. P. - D. F.

ALDER CREEK -- BLOCK 1 - PLOT 1A - 1/10 ACRE

Are equal area adjoining Plot 1 on north was looked over with like results. Not Ribes land. SW. slope 27°.

ALDER CREEK -- BLOCK 1 - Plot 2 - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	2.5	20.0	15.0	Open	
2	G. irr.	7.0	7.0	45.0	42.0	Open	
3	R. vis.	3.0	3.0	15.0	14.0	Open	
4	G. irr.	4.0	4.0	18.0	14.0	Open	
5	R. vis.	2.0	1.5	6.0	5.0	Open	
6	R. vis.	2.5	2.5	6.0	5.0	Open	
7	R. vis.	3.0	3.0	8.0	7.0	Medium	
8	R. vis.	2.5	2.0	7.0	4.0	Medium	

ALDER CREEK - BLOCK 1 - PLOT 2 - 1/2 ACRE (Continued) 1

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
11	R. vis.	3.0	2.5	8.0	6.0	Medium	
12	R. vis.	3.0	3.0	8.0	6.0	Medium	
13	R. vis.	2.5	2.0	7.0	6.0	Light	
14	R. vis.	4.0	3.5	17.0	16.0	Heavy	
15	G. irr.	2.0	2.0	5.0	4.0	Light	
16	G. irr.	2.0	2.0	5.0	5.0	Light	
17	R. vis.	1.5	1.0	2.5	2.0	Light	
18	G. irr.	1.5	1.0	3.0	2.0	Open	
19	G. irr.	2.0	1.5	2.0	1.5	Light	
20	G. irr.	5.0	4.5	25.0	22.0	Light	
21	G. irr.	4.0	4.0	20.0	18.0	Medium	
22	R. vis.	5.0	5.0	40.0	38.0	Open	
23	R. vis.	2.5	2.5	6.0	4.0	Open	
24	G. irr.	2.0	2.0	3.0	3.0	Open	
25	G. irr.	4.0	4.0	20.0	20.0	Open	Many pulled 1922.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
26	G. irr.	5.0	4.5	10.0	8.0	Open	Many pulled 1922.
27	G. irr.	4.5	4.5	10.0	10.0	Open	Many pulled 1922.
28	G. irr.	5.0	5.0	20.00	20.0	Open	Many pulled 1922.
29	G. irr.	4.0	3.5	5.0	4.0	Open	Many pulled 1922.
30	G. irr.	5.0	4.0	7.0	6.0	Open	Many pulled 1922.
31	G. irr.	5.5	4.5	12.0	10.0	Open	Many pulled 1922.
32	G. irr.	7.0	7.0	32.0	32.0	Open	Many pulled 1922.
33	G. irr.	4.0	4.0	10.0	10.0	Open	Many pulled 1922.
34	G. irr.	5.0	5.0	30.0	27.0	Open	May pulled 1922.
37	G. irr.	2.5	2.5	3.5	3.5	Open	With pulled bushes.
38	G. irr.	2.5	2.5	3.5	3.5	Open	With pulled bushes.
39	R. vis.	3.5	3.5	8.0	7.0	Heavy	
40	G. irr.	4.0	3.0	10.0	9.0	Open	
41	G. irr.	3.0	3.0	8.0	6.0	Light	
42	G. irr.	8.0	8.0	150.0	145.0	Open	

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
43	G. irr.	3.0	2.0	6.0	4.0	Light	
44	G. irr.	6.0	6.0	20.0	20.0	Medium	
45	G. irr.	3.0	3.0	6.0	4.0	Medium	
46	G. irr.	3.0	1.5	3.0	1.5	Light	
47	G. irr.	5.0	5.0	15.0	14.0	Light	
48	G. irr.	4.0	4.0	10.0	9.0	Light	
49	G. irr.	8.0	8.0	140.0	135.0	Open	
50	G. irr.	0.4	0.2	0.4	0.2	Open	
51	G. irr.	2.5	1.5	4.0	3.0	Light	
52	G. irr.	3.0	2.5	5.0	4.0	Light	
53	R. vis.	2.0	2.0	2.0	2.0	Medium	
54	R. vis.	4.5	4.0	10.0	7.0	Open	
55	R. vis.	4.5	4.5	25.0	23.0	Open	
56	R. vis.	4.5	4.0	9.0	7.0	Open	
57	G. irr.	2.5	2.5	2.5	2.5	Heavy	

SE. corner is 2 chains W. of SE. corner block. S. edge is in rock slope with light brush cover.

ALDER CREEK - BLOCK 1 - 1923 PLOT 3 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. vis.	3.0	2.0	6.0	4.0	Open	
2	R. vis.	4.0	4.0	20.0	18.0	Open	
3	R. vis.	4.5	4.0	15.0	14.0	Open	
4	R. vis.	4.0	4.0	8.0	8.0	Open	
5	R. vis.	4.5	4.0	25.0	22.0	Open	
6	R. lac.	1.5	1.0	2.0	1.0	Open	
7	R. vis.	3.0	3.0	6.0	5.0	Open	
8	R. vis.	1.0	1.0	2.0	2.0	Open	
10	R. vis.	0.8	0.4	0.8	0.4	Open	
9	R. vis.	1.5	1.0	2.5	2.0	Open	
11	R. vis.	0.5	0.2	0.5	0.2	Open	
12	R. vis.	0.5	0.1	0.5	0.1	Open	
13	R. vis.	1.0	0.6	1.0	0.6	Open	
14	R. vis.	1.5	1.0	1.5	1.0	Open	
15	R. vis.	2.5	2.0	4.0	2.5	Open	

ALDER CREEK - BLOCK 1 - 1923 PLOT 3 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
16	R. vis.	4.5	4.0	10.0	9.0	Open	
17	R. vis.	2.0	2.0	2.0	2.0	Heavy	
18	R. vis.	0.8	0.4	0.8	0.4	Heavy	
19	R. vis.	0.4	0.2	0.4	0.2	Heavy	
20	R. vis.	2.0	2.0	2.0	2.0	Open	
21	R. vis.	1.5	1.0	2.0	1.5	Open	
22	R. vis.	3.0	3.0	6.0	6.0	Open	
23	R. vis.	1.5	0.5	1.5	0.5	Open	
24	R. vis.	2.5	2.0	2.5	2.0	Open	
25	R. vis.	1.5	1.0	1.5	1.0	Open	
26	R. vis.	2.0	1.5	2.5	2.0	Open	
27	R. vis.	2.5	2.5	5.0	5.0	Open	
28	R. vis.	3.5	3.5	10.0	9.0	Open	
29	R. vis.	3.0	3.0	4.0	4.0	Medium	
30	R. vis.	4.0	4.0	10.0	10.0	Open	

ALDER CREEK - BLOCK 1 - 1923 PLOT 3 - 1/10 ACRE (CONTINUED) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S. June 1923	Ft. L. S. 1922	Degree of Concealment	Special Notes
31	R. vis.	7.0	7.0	9.0	9.0	Medium	
32	R. vis.	2.0	2.0	4.5	4.5	Medium	
33	R. vis.	5.5	5.5	20.0	20.0	Medium	
34	R. vis.	5.5	5.0	25.0	24.0	Medium	
35	R. vis.	5.0	4.5	20.0	15.0	Medium	
36	R. vis.	3.0	3.0	4.0	4.0	Medium	
37	R. vis.	3.0	3.0	3.0	3.0	Medium	
38	R. vis.	3.0	2.5	5.0	4.0	Medium	
39	R. vis.	6.5	6.0	25.0	24.0	Medium	
40	R. vis.	5.0	5.0	30.0	30.0	Light	
41	R. lac.	2.0	2.0	5.0	4.0	Heavy	
42	R. vis.	2.0	1.5	2.0	1.5	Heavy	
43	R. lac.	1.0	1.0	1.0	1.0	Heavy	
44	R. vis.	3.0	3.0	5.0	5.0	Medium	
45	R. vis.	1.5	1.5	3.0	2.0	Heavy	

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
46	R. vis.	4.0	4.0	15.0	15.0	Medium	
47	R. vis.	1.0	1.0	1.0	1.0	Light	
48	R. vis.	0.8	0.4	0.8	0.4	Light	
49	R. vis.	1.0	1.0	1.0	1.0	Light	
50	R. vis.	1.5	1.5	1.5	1.5	Light	
51	R. vis.	2.0	1.5	2.0	1.5	Light	
52	R. vis.	2.0	1.5	4.0	2.0	Light	
53	R. vis.	4.0	4.0	7.0	7.0	Medium	
55	R. vis.	0.8	0.8	3.0	0.8	Open	
56	R. vis.	3.0	3.0	8.0	7.0	Open	
57	R. vis.	1.0	1.0	1.0	1.0	Open	
58	R. vis.	1.5	1.5	1.5	1.5	Open	
59	R. vis.	1.0	1.0	2.0	1.0	Open	
60	R. vis.	3.0	3.0	5.0	5.0	Open	
62	R. vis.	0.4	0.2	0.4	0.2	Open	

ALDER CREEK - BLOCK 1 - PLOT 4 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	2.0	1.5	2.0	1.5	Open	
2	R. vis.	1.8	0.8	3.0	1.0	Open	
3	R. lac.	1.0	1.0	1.5	1.5	Heavy	
4	R. lac	1.5	1.0	1.5	1.0	Heavy	
5	R. vis.	2.0	1.0	4.0	1.0	Heavy	
6	R. vis.	0.8	0.5	0.8	0.5	Light	
7	R. lac.	0.8	0.8	2.0	2.0	Light	
9	R. lac.	4.5	4.0	16.0	15.0	Open	
10	R. lac.	1.5	1.0	1.5	1.0	Light	
11	R. lac.	5.0	4.0	15.0	12.0	Light	
12	R. lac.	4.0	3.0	20.0	18.0	Medium	
13	R. vis.	4.5	4.0	7.0	6.0	Medium	
14	R. lac.	3.0	2.0	3.0	2.0	Medium	
15	R. lac.	4.0	3.0	10.0	8.0	Open	
16	R. lac.	1.3	0.4	1.3	0.4	Heavy	
19	R. vis.	1.0	1.0	1.5	1.0	Medium	

In very SW. Corner Block.

ALDER CREEK - BLOCK 1 - 1923 PLOT 5 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	4.0	3.0	20.0	18.0	Light	
2	R. vis.	1.0	0.8	3.0	1.0	Open	
3	R. lac.	3.0	3.0	6.0	5.0	Heavy	
4	R. lac.	1.0	0.3	1.0	0.3	Heavy	
5	R. lac.	1.5	1.0	2.5	2.0	Open	
6	R. lac.	5.0	5.0	10.0	10.0	Light	
7	R. lac.	2.5	2.5	4.0	4.0	Light	
8	R. lac.	2.0	1.0	5.0	2.5	Light	
9	R. lac.	1.5	1.0	2.0	1.0	Open	
10	R. lac.	1.0	1.0	2.0	2.0	Light	
11	R. vis.	1.0	0.5	3.0	0.5	Light	
12	R. vis.	2.5	1.5	2.5	1.5	Open	
13	R. irr.	2.0	2.0	8.0	7.0	Light	
14	R. irr.	1.0	1.0	2.0	1.0	Light	
15	R. irr.	1.5	1.0	1.5	1.0	Heavy	

ALDER CREEK - BLOCK 1 - 1923 PLOT 5 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Feet L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
17	R. irr.	1.0	1.0	1.0	1.0	Heavy	
18	R. irr.	0.8	0.1	0.8	0.1	Heavy	
19	R. irr.	2.5	2.0	3.0	2.0	Heavy	
20	R. irr.	1.0	0.5	2.5	0.5	Heavy	
21	R. lac.	4.0	4.0	20.0	20.0	Open	
22	R. lac.	3.5	3.5	9.0	8.0	Medium	
23	R. lac.	2.0	1.5	2.0	1.5	Medium	
24	R. lac.	2.0	2.0	4.0	4.0	Open	
25	R. lac.	1.5	0.5	1.5	0.5	Heavy	
27	R. irr.	1.5	0.5	5.0	1.5	Open	Under soil.

4 Chains N. of SW. Corner along W. side.
Many lacustre or irrigua seedlings between R. R. & Creek (W. side).

ALDER CREEK - BLOCK 1 - 1923 STRIP 1 - 0.225 ACRE

1/4 x 9 chains along E. edge of Block. No Ribes. Y.P. Type.

Table 40

BOVILL - BLOCK 1 - 1923 PLOT 1 - 1 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	5.5	5.0	10.0	9.0	Heavy	In heavy reproduction. On upturned pile 25' S. of Sec. line & 80' W. of sec. cor.
2	R. lac.	3.5	3.0	15.0	13.0	Heavy	In heavy reproduction. On upturned pile 25' W. of Sec. line & 80' W. of Sec. Cor.
3	R. lac.	0.8	0.4	0.8	0.4	Open	In opening on upturned pile. 3' apart.
4	R. lac.	0.6	0.5	0.6	0.5	Open	In opening on upturned pile. 3' apart.
5	R. lac.	0.4	0.3	0.4	0.3	Open	In opening on upturned pile. 3' apart.

Conditions quite uniform for entire block.
Adjoins NE. Corner Section 33 on SW.

Table 41

BOVILL - BLOCK 2 - 1923 PLOT 1 - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	5.5	5.5	20.0	20.0	Open	13' N. & 2' E. of Sec. Cor.
2	R. lac.	7.0	6.5	40.0	38.0	Open	20' N. & 5' E. of Sec. Cor.

SW. Corner of Block.
Gentle easterly slope.

BOVILL - BLOCK 2 - 1923 PLOT 2 - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.5	1.5	1.8	1.5	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
2	R. lac.	3.0	3.0	5.0	5.0	Light	All in opening in 2nd growth about 15' across with practically no other vegetation.
3	R. lac.	0.8	0.5	0.8	0.5	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
4	R. lac.	0.4	0.2	0.4	0.2	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
5	R. lac.	0.6	0.2	0.6	0.2	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
6	R. lac.	0.4	0.2	0.4	0.2	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
7	R. lac.	0.8	0.1	0.8	0.1	Light	All in opening in 2nd growth about 15' across with practically no other vegetation.
8	R. lac.	2.0	2.0	3.0	3.0	Light	All in opening in 2nd growth about 15' across with practically no other vegetation.
9	R. lac.	1.5	1.5	1.5	1.5	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
10	R. lac.	1.3	1.3	1.3	1.3	Open	All in opening in 2nd growth about 15' across with practically no other vegetation.
11	R. lac.	4.0	3.5	5.0	4.5	Light	In semi-opening.
12	R. lac.	4.0	4.0	14.0	12.0	Light	In semi-opening. All in 15' opening
13	R. lac.	3.0	3.0	11.0	10.0	Light	In semi-opening. All in 15' Opening
14	R. lac.	5.0	4.5	50.0	48.0	Open	In semi-opening. All in 15' opening.
15	R. lac.	8.5	8.0	40.0	37.0	Open	In opening. All in 15' opening.

Adjoins Plot 1 on North. Gentle easterly slope.

BOVILL - BLOCK 2 - PLOT 3 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	4.5	4.5	18.0	18.0	Heavy	3' from creek. From 10' to 20' N. of Sec. line.
2	R. lac.	7.5	7.5	21.0	20.0	Heavy	4' from creek. From 10' to 20' N. of sec. line.
3	R. lac.	3.5	3.0	8.0	7.0	Heavy	4' from creek. From 10' to 20' N. of Sec. Line.
4	R. lac.	6.0	6.0	30.0	30.0	Light	8' from creek. From 10' to 20' N. of Sec. Line.
5	R. lac.	4.5	4.0	10.0	8.0	Light	8' from creek. From 10' to 20' N. of Sec. Line.
6	R. lac.	6.0	5.5	40.0	35.0	Medium	6' from creek. From 10' to 20' N. of Sec. Line.
7	R. lac.	2.5	2.5	10.0	8.0	Heavy	
8	R. lac.	2.5	2.5	6.0	6.0	Heavy	
9	R. lac.	2.5	2.0	12.0	10.0	Heavy	

Coincident with SE. Cor. of Block.
General vegetation 8'. Very rank and dense.
Plot 3 40' W. of SE. Corner.

BOVILL - BLOCK 2 - 1923 PLOT 4 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.0	0.8	1.0	0.8	Light	
2	R. lac.	3.5	3.0	4.5	4.0	Light	
3	R. lac.	1.5	1.5	1.5	1.5	Light	
4	R. lac.	1.5	1.5	1.5	1.5	Medium	
5	R. lac.	1.0	1.0	1.0	1.0	Medium	
6	R. lac.	1.5	1.0	1.5	1.0	Open	
7	R. lac.	4.0	4.0	5.0	5.0	Light	
8	R. lac.	3.5	3.5	3.5	3.5	Light	
9	R. lac.	1.0	1.0	1.0	1.0	Light	
10	R. lac.	0.8	0.3	0.8	0.3	Light	
11	R. lac.	1.0	0.8	1.0	0.8	Light	
12	R. lac.	1.0	0.8	1.0	0.8	Light	
13	R. lac.	1.5	1.0	1.5	1.0	Light	
14	R. lac.	1.0	0.8	1.0	0.8	Light	
15	R. lac.	1.0	0.8	1.0	0.8	Light	

BOVILL - BLOCK 2 - 1923 PLOT 4 - 1/10 ACRE

(Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
16	R. lac.	4.0	4.0	8.0	8.0	Light	
17	R. lac.	0.4	0.4	0.4	0.4	Light	
18	R. lac.	1.5	1.0	1.5	1.0	Light	
19	R. lac.	1.0	0.8	1.0	0.8	Light	
20	R. lac.	2.5	2.0	5.0	3.0	Open	
21	R. lac.	1.0	0.8	1.0	0.8	Light	
22	R. lac.	0.8	0.6	0.8	0.6	Open	
23	R. lac.	4.0	4.0	10.0	10.0	Open	
25	R. lac.	5.0	5.0	8.0	8.0	Heavy	
26	R. lac.	1.5	1.5	1.5	1.5	Open	
27	R. lac.	3.5	3.0	6.0	5.0	Light	
28	R. lac.	1.5	1.0	2.0	1.0	Open	
29	R. lac.	1.5	1.5	1.5	1.5	Open	
30	R. lac.	1.0	1.0	1.0	1.0	Open	

BOVILL - BLOCK 2 - 1923 PLOT 4 - 1/10 ACRE
(Continued) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
31	R. lac.	0.8	0.6	0.8	0.6	Heavy	
32	R. lac.	1.5	1.0	1.5	1.0	Light	

NE. Corner of Block.

BOVILL - BLOCK 2 - 1923 PLOT 5 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.0	1.0	1.0	1.0	Heavy	
2	R. lac.	1.5	1.0	1.5	1.0	Light	
3	R. lac.	1.8	1.5	1.8	1.5	Open	
4	R. lac.	0.6	0.2	0.6	0.2	Open	
5	R. lac.	2.5	2.0	2.5	2.0	Open	
6	R. lac.	1.5	1.5	1.5	1.5	Light	
7	R. lac.	1.5	1.0	1.5	1.0	Light	
8	R. lac.	1.0	0.8	1.0	0.8	Light	

Adjoining Plot 4 on W.

BOVILL - BLOCK 2 - 1923 PLOT 6 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.5	1.5	2.5	1.5	Open	
2	R. lac.	1.0	1.0	1.0	1.0	Open	
3	R. lac.	2.5	2.5	3.5	3.0	Open	
4	R. lac.	1.0	1.0	1.0	1.0	Light	8' W. of trail.

NE. Corner is 3 chains S. of NE. Corner Block.

BOVILL - BLOCK 2 - 1923 PLOT 7 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	2.0	2.0	5.0	4.0	Heavy	
2	R. lac.	2.0	1.5	2.0	1.5	Open	
3	R. lac.	2.5	2.0	3.5	2.0	Open	
4	R. lac.	2.0	1.5	3.0	1.5	Open	
5	R. lac.	0.8	0.8	0.8	0.8	Open	
6	R. lac.	1.0	1.0	1.0	1.0	Heavy	
7	R. lac.	0.8	0.4	0.8	0.4	Open	

Corner on NE. of Plot 7 with SW. Cor. Plot 6.

Table 42

BOVILL -- BLOCK 3 - 2.2 ACRES

Strip 1 - Checked strip 8½' wide along SW line of block from trail up to Block Plot 4 at S.W. corner 1/8 x 10 chains. No Ribes.

Strip 2 - Checked strip 8½' wide along N.W. side of block from Plot 4 at S.W. corner down to N.W. corner 1/8 x 7 chains. No Ribes.

Strip 3 - Checked strip 8½' wide along N.E. side of block from N. W. Corner down to trail 14 chains. No Ribes.

BOVILL - BLOCK 3 - 1923 PLOT 1 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S 1922	Degree of Concealment	Special Notes
1	R. pet.	4.0	3.0	15.0	10.0	Open	In log

NE. Corner 2 chains W. of NE. corner block.
Probably were no other Ribes here.

BOVILL - BLOCK 3 - 1923 PLOT 2 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. pet.	5.0	4.0	50.0	40.0	Open	Water's edge.
2	R. pet.	5.0	4.0	12.0	10.0	Open	Water's edge.
3	R. pet.	6.0	5.0	45.0	35.0	Open	Water's edge.
4	R. pet.	7.5	7.0	70.0	65.0	Open	Water's ege.
5	R. pet.	4.0	3.5	25.0	22.0	Open	Water's edge.

BOVILL - BLOCK 3 - 1923 PLOT 2 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
6	R. pet.	5.5	4.5	35.0	32.0	Open	Water's edge.
7	R. pet.	4.5	4.0	35.0	25.0	Open	Water's edge.
8	R. pet.	2.0	2.0	2.0	2.0	Open	Water's edge.
9	R. pet.	4.0	3.0	15.0	12.0	Open	Water's edge.
10	R. pet.	3.0	2.5	10.0	8.0	Open	Water's edge.
11	R. pet.	5.0	4.0	40.0	30.0	Open	Water's edge.
12	R. pet.	5.0	4.5	20.0	18.0	Open	
13	R. pet.	5.0	4.5	35.0	32.0	Open	
14	R. pet.	5.0	4.0	40.0	35.0	Open	
15	R. pet.	3.0	2.5	10.0	8.0	Open	
16	R. pet.	3.0	2.5	6.0	5.0	Open	
17	R. pet.	4.5	4.0	20.0	18.0	Open	
18	R. pet.	3.5	3.0	10.0	8.0	Open	
19	R. pet.	2.5	1.5	2.5	1.5	Open	
20	R. pet.	3.5	3.0	12.0	10.0	Open	

BOVILL - BLOCK 3 - 1923 PLOT 2 - 1/10 ACRE (Continued) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
21	R. pet.	2.5	1.0	4.0	2.0	Open	
22	R. pet.	4.5	3.5	12.0	10.0	Open	
23	R. pet.	4.5	4.0	10.0	9.0	Open	
24	R. pet.	4.5	4.0	15.0	14.0	Open	
25	R. pet.	2.0	1.5	2.0	1.5	Open	
26	R. pet.	3.0	2.0	20.0	18.0	Open	
27	R. pet.	7.0	6.5	80.0	75.0	Open	
28	R. pet.	5.0	4.5	35.0	32.0	Open	
29	R. pet.	4.0	3.0	35.0	33.0	Open	
30 to 58	Not gathered in detail						

This area must have been missed some way. None of these bushes closer than 1/2 chain to outer boundary. About an equal area and amount of Ribes border this plot to S. and E.

NE. Corner 4 chains W. of NE. Corner Block.

BOVILL - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. pet.	5.0	4.5	25.0	23.0	Open	
2	R. pet.	4.0	4.0	12.0	11.0	Open	
3	R. pet.	3.0	2.0	8.0	7.0	Open	
4	R. pet.	2.0	1.5	2.0	1.5	Open	
5	R. pet.	4.5	4.0	20.0	18.0	Open	
6	R. pet.	3.5	3.5	15.0	14.0	Open	
7	R. pet.	4.0	3.0	15.0	14.0	Open	
8	R. pet.	1.5	1.0	1.5	1.0	Open	
9	R. pet.	1.5	1.5	8.0	8.0	Open	
10	R. pet.	4.5	4.0	15.0	14.0	Open	
11	R. pet.	4.0	4.0	12.0	11.0	Open	
12	R. pet.	4.5	4.0	10.0	9.0	Open	
13	R. pet.	2.0	1.5	2.0	1.5	Open	
14	R. pet.	1.5	1.5	2.5	2.5	Open	
15	R. pet.	2.5	2.5	4.5	4.0	Open	

BOVILL - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
16	R. pet.	1.0	0.5	1.0	0.5	Open	
17	R. pet.	2.0	1.5	2.0	1.5	Open	
18	R. pet.	3.0	3.0	5.0	4.0	Open	
19	R. pet.	3.5	3.5	10.0	9.0	Open	
20	R. pet.	2.5	2.0	2.5	2.0	Open	
21	R. pet.	1.5	1.0	1.5	1.0	Open	Old bush broken 1922.
22	R. pet.	2.5	2.0	2.5	2.0	Open	
23	R. pet.	4.5	4.0	10.0	8.0	Open	
24	R. pet.	4.0	3.0	4.0	3.0	Open	
25	R. pet.	2.0	1.0	2.0	1.0	Open	
26	R. pet.	4.0	3.5	4.0	3.5	Open	
27	R. pet.	2.5	2.0	2.5	2.0	Open	
28	R. pet.	2.0	1.0	2.0	1.0	Open	
29	R. pet.	3.0	2.0	6.0	4.0	Open	
30	R. pet.	4.0	3.0	8.0	6.0	Open	

BOVILL - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE (Continued) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
31	R. pet.	4.0	3.5	9.0	8.0	Open	
32	R. pet.	1.5	1.0	1.5	1.0	Open	
33	R. pet.	2.0	1.0	2.0	1.0	Open	
34	R. pet.	4.0	4.0	8.0	8.0	Open	
35	R. pet.	3.0	3.0	4.0	4.0	Open	
36	R. pet.	4.5	4.0	10.0	9.0	Open	
37	R. pet.	3.5	3.5	6.0	6.0	Open	
38	R. pet.	2.5	2.0	4.5	4.0	Open	
39	R. pet.	2.5	2.0	2.5	2.0	Open	
40	R. pet.	2.0	1.0	2.0	1.0	Open	
41	R. pet.	5.0	4.0	20.0	18.0	Open	
42	R. pet.	2.5	2.5	5.0	5.0	Open	
43	R. pet.	2.0	2.0	3.0	2.0	Open	
44	R. pet.	3.0	2.5	10.0	8.0	Open	
45	R. pet.	2.0	1.0	2.0	1.0	Open	

BOVILL - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE (Continued) 3.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
46	R. pet.	4.0	3.5	5.0	4.0	Open	
47	R. pet.	2.5	1.5	2.5	1.5	Open	
48	R. pet.	2.0	1.0	2.0	1.0	Open	

About 2 chains SW. of Plot 2.
Several pulled bushes growing.
More old bushes growing.
Pulled bushes growing everywhere near water.

BOVILL - BLOCK 3 - 1923 PLOT 4 - 1 ACRE

Checked 1 acre in upper edge of block with no Ribes.

BOVILL - BLOCK 3 PLOT 5 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. pet.	2.0	2.0	2.0	2.0	Open	
2	R. pet.	2.5	2.0	5.0	4.0	Open	
3	R. pet.	3.0	3.0	10.0	10.0	Open	
4	R. pet.	4.5	4.0	10.0	8.0	Open	
5	R. pet.	2.0	2.0	3.0	3.0	Open	

BOVILL - BLOCK 3 - PLOT 5 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
6	R. lac.	2.5	2.0	2.5	2.0	Open	Water's edge
7	R. pet.	2.0	1.0	2.0	1.0	Open	
8	R. pet.	2.0	1.0	4.0	2.0	Open	

Large Lacustre bushes growing again.
About 1 chain N. of S. boundary.

Table 43

SPROUTS FROM 1922 ERADICATION
ELK RIVER, IDAHO - BLOCK 1

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
6	R. vis.	1	0.6	0.0	2.0	0.0	Open	Four shoots have come up from one root of bush pulled last year. Root cut off.
11	R. vis.	2	1.0	0.0	4.0	0.3	Heavy	In Maple bush. Was cut off 4" above roots by crew last year.
12	R. vis.	2	0.8	0.0	2.0	0.3	Medium	Beside Maple bush. Was cut off by crew just above roots.
15	R. vis.	2	1.0	0.0	2.0	0.2	Open	Large bush chopped off 1" above ground.
39	R. vis.	8	1.0	0.0	2.0	0.1	Light	Bush broken & cut off 1" above ground. Three strong sprouts 1923.
	R. vis.	10	0.8	0.0	10.0	0.2	Light	(none) 18 sprouts from old stub cut off 2" above roots.
49	R. vis.	10	0.8	0.0	8.0	0.2	Open	(none) 12 sprouts from old stub cut off 2" above roots.
58	R. vis.	11	0.8	0.0	9.0	0.1	Open	(none) Large bush cut off flush with ground, but 1" above root.
59	R. vis.	11	1.0	0.0	4.0	0.3	Light	(none) Large bush cut off flush with ground, but 3" above root.
70	R. vis.	12	1.0	0.0	3.0	0.1	Light	Large bush cut off 1" above (none) ground. Last year 12 sprouts.
75	R. vis.	12	0.5	0.0	1.0	0.1	Light	Large bush cut off 1" above root. (none)
93	R. vis.	13	0.6	0.0	1.8	0.2	Medium	(none) Large bush cut off 3" above roots last year .4 sprouts 1923.
94	R. vis.	13	0.5	0.0	1.0	0.1	Light	(none) Large bush cut off flush with gound last year. 3 sprouts 1923.
109	R. vis.	14	0.5	0.0	1.0	0.1	Light	3' from other 3 bushes. Was cut off 1922, and other 3 not gotten. Foliage of others within 12 inches.

BLOCK 1 (Continued)

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
111	R. vis.	14	1.0	0.0	3.0	0.4	Medium	(N.W.)Large bush cut off 5" from roots last year. 3 sprouts
112	R. vis.	14	1.0	0.0	3.0	0.3	Heavy	(All ±) Large bush cut off 3" from roots last year. 6 sprouts.
150	R. vis.	15	1.0	0.0	1.0	0.1	Heavy	(All ±) Under dense Ceanothus old bush broken off.
151	R. vis.	15	0.5	0.0	0.5	0.1	Heavy	(All ±) Under dense Ceanothus old bush broken off.
152	R. vis.	15	1.0	0.0	2.0	0.1	Heavy	(All ±)Under dense Ceanothus old bush broken off.
153	R. vis.	15	1.0	0.0	1.5	0.1	Heavy	(All ±) Under dense Ceanothus old bush cut off last year.
162	R. vis.	15	0.5	0.0	1.0	0.1	Light	(E.W.)Cut off last year and 6 sprouts coming from it.
173	R. vis.	16	0.6	0.0	2.0	0.2	Open	Large bush cut off flush with ground last year, but 4" above root. (none)
174	R. vis.	16	0.8	0.0	2.0	0.7	Medium	(W.) Large bush cut off 7" above ground. Sprouted.
176	R. vis.	16	0.8	0.0	2.0	0.2	Light	(none) Old bush cut off 2" above ground last year. Sprouted.
180	R. vis.	16	1.0	0.0	3.0	0.3	Heavy	(N) In south edge of dense Ceanothus. Old bush cut off. Sprouted.
182	R. vis.	16	1.0	0.0	3.0	0.1	Medium	(N.E.) On south west edge dense Ceanothus.
183	R. vis.	16	1.0	0.0	3.0	0.2	Heavy	(All ±) In dense Ceanothus large bush cut off 2" above ground. Sprouted.
185	R. vis.	16	1.0	0.0	3.0	0.1	Light	(none) Old bush cut 1" above ground. Sprouted.
190	R. vis.	16	0.7	0.0	2.0	0.1	Light	(none) Old bush cut off. Sprouted.

BLOCK 1 (Continued) 2

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
191	R. vis.	16	1.0	0.0	6.0	0.3	Light	(None) Old bush cut off 3" above root. Sprouted.
192	R. vis.	16	1.0	0.0	1.0	0.1	Open	(None) Old bush pulled. One root broken off. Sprouted.
198	R. vis.	16	1.0	0.0	2.0	0.1	Light	(S.) Old bush broken off and sprouted.
200	R. vis.	16	1.0	0.0	2.0	0.5	Medium	(N.) Old bush cut off 6" above ground - sprouted.
203	R. vis.	16	0.5	0.0	1.0	0.1	Light	(E.) Old bush cut off flush Sprouted.
204	R. vis.	16	0.3	0.0	0.0	0.1	Light	(None) Old bush cut off 1" below ground - sprouted.
206	R. vis.	16	0.7	0.0	1.5	0.1	Heavy	(None) General vegetation 18" - 24".
208	R. vis.	16	0.6	0.0	1.0	0.1	Heavy	(None) old bush cut off flush - Sprouted.
209	R. vis.	16	0.6	0.0	2.0	0.1	Heavy	(None) Old bush cut off 1" below ground - sprouted.
211	R. vis.	16	0.6	0.0	2.0	0.1	Heavy	(None) Old bush cut off 1" above ground - sprouted.
212	R. vis.	16	0.7	0.0	10.0	0.1	Heavy	(None) Old bush cut off 1" above ground - sprouted.
228	R. vis.	17	1.0	0.0	4.0	0.4	Open	(N.E.) Old bush cut off 4" above ground.
229	R. vis.	17	1.0	0.0	2.0	0.1	Light	(None) Old bush cut off 4" above ground.
231	R. vis.	17	0.5	0.0	2.0	0.1	Light	(N.) Old bush cut off 1" below ground.
232	R. vis.	17	0.6	0.0	2.0	0.1	Light	(All ~~1~~) Old bush cut off flush - in middle salix clump.

BLOCK 1 (Continued) 3

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
233	R. vis.	17	1.0	0.0	4.0	0.4	Open	(None) Old bush cut off 4" above ground. Bare ground.
235	R. vis.	17	0.6	0.0	2.0	0.3	Light	(None) Old bush cut 3" above ground.
236	R. vis.	17	0.6	0.0	1.0	0.1	Medium	(N.W.) Old bush cut 1" below ground.
238	R. vis.	17	0.6	0.0	2.0	0.2	Heavy	(All ±) Old bush broken 3" above ground - sprouted. In dense Ceanothus.
247	R. vis.	17	0.8	0.0	3.0	0.1	Heavy	(None) General vegetation 4' old bush cut 1" below ground sprouted.
252	R. vis.	18	0.8	0.0	3.0	0.1	Open	(N.) Old bush cut flush - sprouted.
253	R. vis.	18	0.8	0.0	4.0	0.1	Open	(None) Old bush cut flush-sprouted - 3' diameter.
263	R. vis.	18	1.0	0.0	4.0	0.2	Medium	(All ±) 8' S.W. of 262 in heavy Ceanothus. Cut off 1922.
264	R. vis.	18	0.6	0.0	2.0	0.3	Medium	(All ±) 6' W. of 263 in heavy Ceanothus. Cut off 1922.
266	R. vis.	18	0.5	0.0	1.5	0.1	Medium	(All ±) 3' W. of 265 in heavy Salix. Cut off 1922.
269	R. vis.	18	0.5	0.0	1.0	0.1	Medium	(E.) Cut off last year 6" from 268-269.
271	R. vis.	18	0.8	0.0	5.0	0.1	Medium	(W.) 5' W. of draw. Old cut bush flush - sprouted.
272	R. vis.	18	0.5	0.0	1.0	0.1	Heavy	(SE. S. SW.) Old bush cut flush.
273	R. vis.	18	0.5	0.0	1.0	0.1	Light	(S.E.) Old bush cut 1" under.
275	R. vis.	18	0.5	0.0	1.0	0.3	Light	(N.W.) Old cut bush 3" above ground.

BLOCK 1 (Continued) 4

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S.	Degree of Concealment	Special Notes
277	R. vis.	18	1.0	0.0	1.5	0.1	Medium	(N.) Old cut bush 1" above.
292	R. vis.	19	0.8	0.0	3.0	0.2	Medium	(None) Old bush cut 2" above ground.
294	R. vis.	19	0.4	0.0	1.0	0.1	Open	(None) Old bush cut 1" above in 1922 - 50' W. of draw.
295	R. vis.	19	0.3	0.0	0.5	0.1	Light	(None) Old bush cut 3" below in 1922 - 50' W. of draw.
296	R. vis.	19	0.6	0.0	3.0	0.1	Open	(None) Old bush cut 3" above roots 1922 40' W. of draw.
297	R. vis.	19	0.1	0.0	4.0	0.3	Heavy	(None) Center Cherry bush. Old bush cut 3" above ground. 8' W. of draw.
299	R. vis.	19	1.0	0.0	3.0	0.6	Heavy	(None) In heavy snow brush. On S.E. edge of big hole filled with logs.
300	R. vis.	19	0.8	0.0	3.0	0.2	Medium	(None) In heavy snow brush. On S.E. edge of big hole filled with logs.
301	R. vis.	19	1.0	0.0	2.0	0.1	Medium	(None) In heavy snow brush. On S.E. edge of bighole filled with logs.
303	R. vis.	19	1.2	0.0	7.0	0.2	Medium	(None) Old bush cut 2" above ground.
304	R. vis.	19	0.8	0.0	3.0	0.1	Open	(None) Old bush cut 1" above ground.
314	R. vis.	20	1.0	0.0	3.0	0.1	Light	(None) Between logs. Old bush broken 1" above ground.
315	R. vis.	20	1.0	0.0	4.0	0.2	Medium	(None) Old bush broken 2" above ground.
318	R. vis.	20	1.0	0.0	3.0	0.5	Medium	(W.) Cut off 6" above roots.
319	R. vis.	20	1.0	0.0	5.0	0.1	Open	(None) Cut off flush.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
321	R. vis.	20	0.8	0.0	4.0	0.2	Light	(None) Cut off 2" above ground.
323	R. vis.	20	1.0	0.0	3.0	0.1	Medium	(None) Cut off last year 1" above roots.
324	R. vis.	20	1.0	0.0	4.0	0.1	Medium	(None) Cut off last year.
325	R. vis.	20	0.4	0.0	0.4	0.1	Light	(None) Cut off flush.
326	R. vis.	20	0.8	0.0	3.0	0.1	Open	(None) Cut off flush.
328	R. vis.	20	0.5	0.0	0.5	0.1	Medium	(S.W.) Both cut off 1" above ground - 15" apart.
329	R. vis.	20	0.5	0.0	1.0	0.1	Light	(None) Both cut off 1" above ground - 15" apart.
334	R. vis.	20	0.6	0.0	0.6	0.4	Heavy	(All ±) Under snow brush. Cut off 4" above roots.
339	R. vis.	20	0.5	0.0	2.0	0.1	Medium	(None) Cut off 1" above roots.
340	R. vis.	20	0.5	0.0	1.0	0.1	Medium	(None) Cut off 1" above roots.
341	R. vis.	20	0.8	0.0	2.0	0.1	Medium	(None) Cut off 1" above roots.
1	R. vis.	21	1.0	0.0	2.0	0.2	Open	(None) Cut off 2" above roots.
2	R. vis.	21	1.0	0.0	2.0	0.2	Light	(None) Cut off 2" above roots.
9	R. vis.	21	0.5	0.0	1.0	0.1	Light	(None) Old bush cut flush 6' S. W. of #8.
11	R. vis.	21	1.0	0.0	4.0	0.3	Heavy	(All ±) Cut off 3" above ground. 30' E. of draw.

BLOCK - 1 (Continued) 6

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Ft. L. S. 1922	Degree of Concealment	Special Notes
12	R. vis.	21	0.5	0.0	1.0	0.4	Heavy	(All ±) Cut off 4" above ground. 15' E. of draw.
32	R. vis.	21	0.1	0.0	5.0	0.1	Heavy	(All ±) Cut off 1" above ground. In Salix clump. 30' E. of draw.
35	R. vis.	22	0.8	0.0	0.8	0.3	Medium	(E.) Cut off 3" above ground. In W. edge Maples 40' west of draw.
37	R. vis.	22	0.7	0.0	2.0	0.5	Light	(None) Cut off 5" above ground 15' W. of draw in open willow.
41	R. vis.	22	1.0	0.0	3.0	1.0	Medium	(SE. - S.) Cut off 12" from ground 20' E. of draw 2' S.E. old trial N.E. - S.W.
46	R. vis.	22	0.8	0.0	2.0	0.1	Open	(None) Cut off flush.
47	R. vis.	22	0.5	0.0	2.0	0.1	Medium	(None) Cut off 1" below ground.
48	R. vis.	22	1.0	0.0	2.0	0.1	Open	(None) Cut off flush.
50	R. vis.	23	0.6	0.0	0.6	0.1	Heavy	(None) Cut off flush. In Salix 3' above road.
51	R. vis.	23	0.8	0.0	2.0	0.8	Open	(None) One stalk broken off 8" above ground. One stalk cut flush. 6" apart.
52	R. vis.	23	0.5	0.0	1.0	0.1	Light	(None) Cut flush.
53	R. vis.	23	0.5	0.0	1.0	0.1	Medium	(None) Cut 3" below ground.
55	R. vis.	23	0.6	0.0	2.0	0.1	Medium	(None) In open Salix.
67	R. vis.	23	0.6	0.0	1.0	0.1	Light	(W.-SW.) Cut flush. 1" from 66.
74	R. vis.	24	0.5	0.0	1.0	0.3	Medium	(S.E.) N.W. side dense snow bush. SW. Cor. Plot 1. 30" left.

BLOCK - 1 (Continued) 7

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S. June 1923	Ft. L. S. 1922	Degree of Concealment	SPECIAL NOTES
75	R. vis.	24	0.5	0.0	1.0	0.1	Heavy	(All ±)In dense snow brushSW. Cor. Plot 1 35' left. Cut of 1" high.
77	R. vis.	24	0.5	0.0	1.0	0.1	Heavy	(All ±) In dense snow brush 15' S. of log pile. Cut off 1" high.
79	R. vis.	24	1.0	0.0	2.0	0.1	Medium	(None) General vegetation equal 28' Sc. log pile
82	R. vis.	24	0.6	0.0	2.0	0.1	Medium	(None)General vegetation 3' (Heavy) Broken off flush.
86	R. vis.	24	1.0	0.0	3.0	0.1	Light	(None) General vegetation 12" - 18" cut off flush.
88	R. vis.	24	0.8	0.0	2.0	0.3	Heavy	(All ±) General vegetation 3' but flush - sprouted - One 3" stalk not cut.
95	R. vis.	24	1.2	0.0	4.0	0.4	Medium	(S.) Old bush cut off without taking root crown.
96	R. vis.	25	0.5	0.0	2.0	0.1	Light	(None) Cut off flush. One root left separate-sprouted. Now 2 bushes.
97	R. vis.	25	1.0	0.0	2.0	0.1	Light	(None) Cut off flush.
99	R. vis.	25	1.0	0.0	3.0	0.8	Open	(None) Bush broken off 8" high.
100	R. vis.	25	0.5	0.0	1.0	0.1	Open	(None) Cut off flush.
101	R. vis.	25	1.0	0.0	1.0	0.1	Light	(W.) Left after part of root pulling last year.
104	R. vis.	25	0.5	0.0	0.5	0.1	Heavy	(S.W.) N. edge dense Salix Cut off flush last year.
108	R. vis.	25	1.0	0.0	3.0	0.1	Heavy	(W.) In Amelanchier. 6' SW. of 105-7.
115	R. vis.	25	0.6	0.0	2.0	0.1	Open	(None) Cut 1" Underground.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
116	R. vis.	25	0.5	0.0	2.0	0.4	Open	(None) Cut 4" above ground.
118	R. vis.	25	0.2	0.0	1.0	0.1	Light	(None) Cut off flush.
123	R. vis.	25	1.5	0.0	2.0	0.5	Heavy	(All ±) In Salix clump. Old bush broken off 5" above ground.
124	R. vis.	26	1.0	0.0	4.0	0.4	Heavy	(All ±) In Acer and snow brush cut off 5" above ground - 12' from fence.
130	R. vis.	26	1.5	0.0	6.0	0.1	Open	(None) Cut flush last year. 10' circle.
133	R. vis.	26	1.2	0.0	4.0	0.1	Heavy	(All ±) Dense snow brush. Cut flush.
	R. vis.	26	0.3	0.0	1.0	0.1	Medium	(All ±) Cut flush.
144	R. vis.	26	0.8	0.0	2.0	0.1	Medium	(W.) Cut flush.
145	R. vis.	26	0.5	0.0	2.0	0.1	Heavy	(All ±) Cut flush.
147	R. vis.	26	0.6	0.0	2.0	0.1	Heavy	(All ±) Cut flush.
151	R. vis.	26	1.0	0.0	5.0	0.1	Open	(None) Cut flush.
152	R. vis.	26	0.5	0.0	2.0	0.1	Open	(None) Cut 1" above.
157	R. vis.	26	0.8	0.0	2.0	0.1	Medium	(None) Cut flush.
159	R. vis.	27	1.0	0.0	6.0	0.1	Open	(None) Cut flush.
160	R. vis.	27	1.0	0.0	3.0	0.1	Heavy	(All ±) Cut 1" above.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
182	R. vis.	27	0.5	0.0	2.0	0.1	Medium	(SW.) Cut flush.
190	R. vis.	27	0.5	0.0	1.0	0.1	Medium	(S.) Cut flush.
196	R. vis.	27	1.0	0.0	3.0	0.1	Open	(None) Cut flush.
203	R. vis.	28	1.0	0.0	6.0	0.1	Medium	(None) In very open Salix. Cut flush.
207	R. vis.	28	0.5	0.0	1.0	0.1	Light	(S.) Cut off 1" above.
213	R. vis.	28	1.0	0.0	3.0	0.2	Heavy	(All ±) Cut 2" high.
214	R. vis.	28	1.0	0.0	3.0	0.8	Heavy	(All ±) Cut 9" high. Partly under log.
215	R. vis.	28	1.0	0.0	3.0	0.1	Heavy	(All ±) Cut 1" high. Heavy mixed brush.
220	R. vis.	28	0.8	0.0	2.0	0.2	Open	(None) Cut 2" above.
222	R. vis.	28	0.5	0.0	2.0	0.2	Light	(None) On S. edge of bare opening.
225	R. vis.	28	0.8	0.0	2.0	0.1	Heavy	(All) Under dense snow. Brush.
228	R. vis.	28	0.5	0.0	2.0	0.4	Medium	(All ±) Cut at base, and 1 stalk 4" high.
3	R. vis.	29	0.8	0.0	2.0	0.3	Light	(None) Cut 3" high.
8	R. vis.	29	1.0	0.0	2.0	0.2	Heavy	(All ±) Cut 2" high.
13	R. vis.	29	1.0	0.0	2.0	0.1	Light	(SW.) Cut flush.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	SPECIAL NOTE
26	R. vis.	29	1.0	0.0	3.0	0.3	Open	(None) Broken off 3" high 1922.
27	R. vis.	29	1.0	0.0	2.0	0.1	Open	(None) Cut 1" below. 10' S. of upturned stump.
28	R. vis.	29	1.0	0.0	4.0	0.2	Open	(None) Cut 2" above. 10' S. of upturned stump.
35	R. vis.	29	1.0	0.0	2.0	0.1	Medium	(W.) Cut 1" below.
40	R. vis.	29	1.0	0.0	1.0	0.1	Medium	(All ±) Cut 1" high.
41	R. vis.	29	1.0	0.0	2.0	0.1	Medium	(All ±) Cut flush.
82	R. vis.	30	0.8	0.0	2.0	0.1	Heavy	(All ±) Cut flush.
85	R. vis.	30	0.5	0.0	1.0	0.1	Medium	(All ±) Cut flush.
92	R. vis.	31	0.6	0.0	1.0	0.1	Heavy	(All ±) Cut flush.
93	R. vis.	31	0.5	0.0	1.0	0.1	Heavy	(All ±) Cut flush.
114	R. vis.	31	1.2	0.0	6.0	0.3	Open	(S.) Cut 3" above because under log.
126	R. vis.	31	1.3	0.0	5.0	0.1	Light	(None) Cut flush 1' apart.
127	R. vis.	31	1.0	0.0	3.0	0.1	Light	(None) Cut flush 1' apart.
133	R. vis.	32	1.0	0.0	2.0	0.1	Heavy	(All ±) Cut flush. (3 other small bushes within 2').
136	R. vis.	32	0.5	0.0	1.0	0.1	Medium	(All ±) Cut 1" below.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
137	R. vis.	32	1.0	0.0	5.0	0.3	Light	(None) Cut 3" above.
162	R. vis.	32	1.0	0.0	5.0	0.1	Light	(NE.) In open brush cut 1" above.
172	R. vis.	32	1.0	0.0	5.0	0.3	Light	(None) Cut 3" above.
173	R. vis.	32	0.4	0.0	1.0	0.1	Light	(None) Cut 1" above.
176	R. vis.	32	0.8	0.0	4.0	0.1	Medium	(S.) Cut flush.
21	R. vis.	33	0.8	0.0	1.0	0.3	Medium	(None) Cut off 1922 3" high.
33	R. vis.	33	1.0	0.0	2.0	0.1	Heavy	(All) 5' E. of this group.
52	R. vis.	33	1.3	0.0	2.0	0.1	Medium	(None) Cut flush. Center Salix & Ceanothus clump.
56	R. vis.	34	1.0	0.0	6.0	0.1	Medium	(None) Cut flush. In Salix clump.
75	R. vis.	34	0.8	0.0	1.5	0.3	Medium	(W.) Cut 3" high 1922.
97	R. vis.	34	0.5	0.0	1.0	0.1	Medium	(None) Cut 1" high.
101	R. vis.	34	1.0	0.0	2.0	0.1	Medium	(None) Cut flush.
111	R. vis.	34	0.5	0.0	1.0	0.1	Medium	(None) Cut flush.
137	R. vis.	36	0.9	0.0	2.0	0.1	Heavy	(All ±) Dense Ceanothus. Cut flush.
138	R. vis.	36	1.0	0.0	2.0	0.3	Light	(None) Cut 3" high. Partly under log.

BLOCK - 1 (Continued) 12

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
150	R. vis.	36	1.0	0.0	2.0	0.2	Heavy	(All ±) Under Ceanothus cut 2" high.
159	R. vis.	37	1.0	0.0	2.0	0.1	Heavy	(All) Cut flush. Dense Ceanothus.
165	R. vis.	38	0.6	0.0	1.0	0.1	Medium	(N.E.) Cut flush.
170	R. vis.	38	1.0	0.0	5.0	0.3	Medium	(All ±) Cut 3" high Ceanothus cover. Cut flush.
171	R. vis.	38	1.0	0.0	3.0	0.1	Medium	(All ±) Cut flush. Ceanothus cover.
175	R. vis.	38	0.8	0.0	3.0	0.1	Heavy	(All ±) Dense Ceanothus.
180	R. vis.	38	0.6	0.0	0.6	0.1	Medium	(None) Cut 1" under 1922.
1	R. vis.	2	0.8	0.0	2.0	0.1	Medium	Cut flush 1922.
26	R. vis.	10	1.5	0.0	3.0	0.2	Open	In burned out stump. Cut 2" high 1922 12' N. of fence.
30	R. vis.	13	0.8	0.0	2.0	0.1	Heavy	Cut flush in maple clump.
33	R. vis.	18	1.0	0.0	4.0	0.1	Medium	Cut flush 20' N. of fence.
37	R. vis.	30	1.0	0.0	2.0	0.1	Light	Cut 2" deep. 40 SW. of brick bldg., 3' E. of trail.

Table 44

MISSED BUSHES 1922 ERADICATION

ELK RIVER, IDAHO - BLOCK 1

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
30	R. vis.	1	3.0	2.5	15.0	11.0	Heavy	Under edge of Maple shrub visible from W.&S. only.
1	R. vis.	1	1.0	0.8	7.0	3.5	Heavy	Very easily seen from N.E. only
2	R. vis.	1	0.5	0.3	1.0	0.7	Open	Entirely in open.
3	R. vis.	1	1.5	1.0	3.0	2.0	Medium	Easily seen anywhere except from N. W.
4	R. vis.	1	1.0	0.5	1.0	0.4	Light	Looks like part of brush pulled off in eradication, but this part left.
5	R. vis.	1	4.5	4.2	65.0	50.0	Heavy	In Maple clump, but not difficult to see. Against fence.
7	R. vis.	1	0.5	0.3	2.0	0.8	Open	A pulled bush broke off 2" above ground. Smaller branches cut off.
8	R. vis.	2	2.0	2.0	5.0	4.0	Light	No. excuse.
9	R. vis.	2	4.5	4.0	20.0	15.0	Heavy	In middle of snow brush.
10	R. vis.	2	2.5	2.5	8.0	7.0	Heavy	In middle of Amelanchier.
13	R. vis.	2	1.5	1.5	8.0	5.0	Open	Quite, open. No excuse.
14	R. vis.	2	0.8	0.5	1.5	1.0	Light	No vegetation immediately adjoining.
16	R. vis.	2	1.5	1.2	1.5	1.2	Open	Single stalk - hard to see even in open.
17	R. vis.	2	2.5	2.3	8.0	7.0	Open	No possible excuse.
18	R. vis.	2	1.2	0.6	2.0	0.8	Open	Low grass only other vegetation

BLOCK 1 (Continued) 1

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	SPECIAL NOTES
19	R. vis.	2	5.0	5.0	54.0	44.0	Heavy	In Willow bush.
20	R. vis.	4	2.0	1.5	4.0	2.0	Heavy	Under edge of maple bush.
21	R. vis.	4	2.2	2.0	10.0	8.0	Open	In open grass & low herbs.
22	R. vis.	4	3.4	3.0	13.0	10.0	Open	No excuse. Only shrub beside black stump.
23	R. vis.	4	2.5	2.5	20.0	15.0	Open	Open grass. No excuse.
24	R. lac.	5	1.5	1.0	2.0	1.5	Medium	Difficult to see in brush.
25	R. lac.	5	1.0	0.8	1.0	0.8	Medium	Difficult to see in brush.
26	R. vis.	6	4.0	4.0	32.0	30.0	Medium	On edge of Maple bush, but not in it. Visible from all but S. E.
27	R. vis.	6	2.5	2.0	4.0	3.0	Medium	In mixed brush of equal height. Excusable.
28	R. vis.	6	2.0	2.0	10.0	8.0	Open	No excuse. In vegetation 4" to 6" high.
29	R. vis.	6	4.0	3.5	8.0	7.0	Medium	Mixed with Rosa & Amelanchier of equal height.
31	R. vis.	7	1.4	1.0	3.0	2.0	Light	Bare ground S. & W.
32	R. vis.	7	1.5	1.0	2.0	1.0	Medium	(SW. &W.) In depression.
33	R. vis.	7	2.5	2.0	5.0	4.0	Open	(None) No excuse.
34	R. vis.	7	3.0	2.5	7.0	4.0	Light	(None) No excuse.

BLOCK - 1 (Continued) 2

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
35	R. vis.	7	1.5	1.0	4.0	3.0	Heavy	(W.&N.) Hard to see.
36	R. lac.	7	3.0	3.0	8.0	8.0	Open	Easy to see very little vegetation. 60' from draw. (N.)
37	R. vis.	8	2.0	1.5	2.5	2.0	Heavy	(All ±) Difficult brush.
38	R. vis.	8	2.3	2.0	7.0	5.0	Light	(N.) Easily seen. Bush pulled 16" distant.
40	R. vis.	8	1.5	1.0	2.0	1.5	Light	Should not be missed. (None)
41	R. vis.	8	1.3	1.0	2.0	1.0	Open	(None) Easy.
42	R. vis.	9	2.0	1.5	5.0	2.0	Open	(S.) Easy.
43	R. lac.	9	2.5	2.5	8.0	7.0	Light	(N.W.) Easy.
44	R. vis.	9	2.5	2.5	5.0	4.0	Light	(S.) On North edge Amelanchier bush.
45	R. vis.	9	3.8	3.8	33.0	30.0	Medium	In very open Maple clump.
46	R. vis.	10	3.5	3.0	4.0	3.5	Medium	(All ±) In very open single-stalked Salix.
47	R. vis.	10	0.3	0.3	0.3	0.3	Heavy	(All ±) In Salix brush.
50	R. vis.	10	1.5	1.0	1.5	1.2	Open	(None) General vegetation
51	R. vis.	10	2.8	2.5	8.0	6.0	Light	(All ±) General vegetation
52	R. vis.	10	2.0	1.5	2.5	2.0	Light	(None) General vegetation same height.

BLOCK - 1 (Continued) 3

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft. L.S June 1923	Feet L.S. 1922	Degree of Concealment	SPECIAL NOTES
53	R. vis.	11	3.5	3.5	50.0	45.0	Open	(None) No excuse.
54	R. vis.	11	3.0	3.0	7.0	6.0	Medium	(N.) Difficult.
55	R. vis.	11	0.6	0.5	0.8	0.6	Open	(None) General vegetation equal height.
56	R. vis.	11	3.0	2.5	8.0	6.0	Medium	(None) General vegetation equal height.
57	R. vis.	11	0.5	0.3	0.5	0.3	Open	(None) Seedling.
60	R. vis.	11	2.5	2.0	5.0	4.0	Medium	(E.) General vegetation equal height.
61	R. vis.	11	1.5	1.0	3.0	2.0	Heavy	(E.S.) General vegetation much higher.
62	R. vis.	11	4.5	4.0	12.0	11.0	Heavy	(W.) In rather open Maple bush.
63	R. vis.	11	1.2	1.0	1.2	1.0	Open	(None) General vegetation equal height. Was in clump of large bushes pulled 1922.
64	R. vis.	11	3.0	3.0	8.0	7.0	Open	Average vegetation 6" to 10" around it. (None)
65	R. vis.	11	2.0	1.5	4.0	2.0	Open	(None) Part of lage bush cut off 1922. One stalk broken OFF 8" above ground.
66	R. vis.	11	1.0	1.0	2.0	2.0	Open	(None) Another cut off 4" from ground. One stalk left entire.
67	R. vis.	12	2.5	2.0	6.0	5.0	Light	(None) No excuse.
68	R. vis.	12	2.0	2.0	4.0	3.5	Heavy	(None) Difficult.
69	R. vis.	12	1.0	0.8	3.0	1.5	Light	(None) General vegetation equal height.

BLOCK - 1 (Continued) 4

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
71	R. vis.	12	1.2	1.0	1.2	1.0	Open	(None) General vegetation equal height.
72	R. vis.	12	1.5	1.2	1.5	1.5	Open	(None) General vegetation slightly less.
73	R. vis.	12	1.0	0.5	1.0	0.5	Open	(None) General vegetation equal height.
74	R. vis.	12	1.0	0.8	1.0	0.8	Light	(None) General vegetation slightly more.
76	R. vis.	12	1.0	1.0	1.5	1.3	Open	(None) General vegetation equal height.
77	R. vis.	12	2.0	2.0	5.0	4.5	Light	(W.) Close to a willow bush.
78	R. vis.	12	2.0	2.0	3.0	3.0	Open	(None) no excuse.
79	R. vis.	12	1.0	0.8	1.0	0.8	Light	(None) General vegetation slightly higher.
80	R. vis.	12	0.7	0.5	0.7	0.5	Heavy	(All ±) General vegetation 5'.
81	R. vis.	12	1.3	1.0	1.3	1.0	Light	(E.) General vegetation equal.
82	R. vis.	12	2.0	1.5	6.0	5.0	Medium	(S.) Between a W.P. and Salix
83	R. vis.	12	1.5	1.5	4.5	4.0	Medium	(E.) Under edge of W.P.
84	R. vis.	12	0.5	0.3	1.0	0.6	Heavy	(All ±) General vegetation 18". In 10' circle 50' N. of big curve of road 35 W of trail
85	R. vis.	12	0.6	0.3	1.0	0.5	Medium	(None) General vegetation 12" In 10' circle 50' No. of big curve of road. 35' W. of trail.
86	R. vis.	12	2.5	1.5	4.0	2.0	Open	(None) General vegetation 12" In 10' circle 50' N. of big curve of road. 35' W. of trail.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	SPECIAL NOTES
87	R. vis.	12	1.0	0.5	1.0	0.5	Open	(None)General vegetation 8" In 10' circle 50' N. of big curve of road. 35'W. of Trail
88	R. vis.	12	2.8	2.0	5.0	2.0	Open	(None)General vegetation 8" In 10' circle 50' N. of big curve of road. 35'W. of trail.
89	R. vis.	12	2.0	1.5	4.0	3.0	Open	(None)General vegetation 12" In 10' circle 50'N. of big curve of road. 35'W. of trail.
90	R. vis.	12	1.0	1.0	2.0	1.5	Open	(None)General vegetation 10" In 10'circle 50'N. of big curve of road. 35'W. of trail.
91	R. vis.	13	3.0	2.5	14.0	10.0	Medium	In very open Willow (Salix) bush. (None)
92	R. vis.	13	1.5	1.0	2.5	2.0	Open	(S.) North of Amelanchier bush 1'.
95	R. vis.	13	1.5	1.5	4.0	4.0	Medium	(S.W.) In opening between higher Salix.
96	R. vis.	13	2.0	2.0	4.0	3.0	Open	(None) In open ground.
97	R. vis.	13	2.5	2.0	7.0	5.0	Medium	(N.) In small open bush of Ceanothus velutinus.
98	R. vis.	13	1.0	0.7	1.5	1.0	Open	(None) In opening surrounded by vegetation 4" high.
99	R. vis.	14	5.0	5.0	14.0	12.0	Medium	(None ±) These four bushes scattered in depression, caused by wind-blown stump.
100	R. vis.	14	3.5	3.0	5.0	4.0	Light	(None ±)These bushes scattered in depression, caused by wind-blown stump.
101	R. vis.	14	2.0	1.5	3.0	2.0	Medium	(None ±)These bushes scattered in depression, caused by wind-blown stump.
102	R. vis.	14	2.0	2.0	3.0	3.0	Medium	(None ±)These bushes scattered in depression caused by wind-blown stump.
103	R. vis.	14	4.0	4.0	8.0	7.0	Medium	(W-N) One stalk of a large bush pulled last year.

BLOCK - 1 (Continued) 6.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
104	R. vis.	14	3.0	2.5	5.0	3.5	Medium	(W-N) 18" from large bush cut out last year.
105	R. vis.	14	1.5	1.0	1.5	1.0	Open	(None) In very open area.
106	R. vis.	14	3.0	2.8	8.0	7.0	Light	(None) No excuse.
107	R. vis.	14	5.0	4.5	20.0	16.0	Heavy	(All ±) Log had fallen on it, and flattened it out beneath W. P.
108	R. vis.	14	4.0	4.0	9.0	8.0	Medium	(S.E.) In open brush.
110	R. vis.	14	2.5	2.5	5.0	4.5	Light	(W.) In opening between large bushes.
113	R. vis.	14	3.0	2.7	6.0	5.0	Open	(None) No excuse.
114	R. vis.	14	0.6	0.5	0.6	0.5	Light	(None) Seedlings hard to see, 18" apart.
115	R. vis.	14	0.6	0.5	0.6	0.5	Light	(None) Seedlings hard to see, 18" apart.
116	R. vis.	14	3.0	3.0	5.0	4.0	Light	(None) with a snow brush.
117	R. vis.	14	1.0	0.8	4.0	3.0	Open	(None) General vegetation lower.
118	R. vis.	14	1.0	1.0	2.0	2.0	Open	(None) Very open. Practically no vegetation.
119	R. vis.	14	1.5	1.0	1.5	1.0	Medium	(N-W-thick) In Salix thicket.
120	R. vis.	14	1.3	1.0	4.0	3.0	Open	(None) No excuse.
121	R. vis.	14	0.7	0.5	0.7	0.5	Open	(None) Very thin vegetation Much bare ground.

BLOCK - 1 (Continued) 7

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Ft. 1922	Ft. L.S June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
122	R. vis.	14	1.0	1.0	1.0	1.0	Light	(SW) In S.W. edge of opening. Practically bare on 3 sides.
123	R. vis.	14	0.6	0.5	1.0	0.6	Open	(None) Surrounding vegetation 2" high.
124	R. vis.	14	2.5	2.0	8.0	6.0	Open	(None) Surrounding vegetation equal height (not dense.)
125	R. vis.	14	0.5	0.5	2.0	2.0	Open	(N.) Surrounding vegetation 12 to 18" high (Open)
126	R. vis.	14	1.3	1.3	4.0	3.0	Light	(N.) On N. edge of opening. Bordered by Maple on N.
127	R. vis.	14	2.5	2.5	4.5	4.0	Light	(W.) No excuse for this bush.
128	R. vis.	15	2.3	2.0	10.0	8.0	Open	(None) General vegetation 8".
129	R. vis.	15	1.3	1.0	1.3	1.0	Open	(None) General vegetation same.
130	R. vis.	15	1.0	0.8	1.0	0.8	Medium	(SE) In edge of huckleberry bush.
131	R. vis.	15	1.8	1.5	1.8	1.5	Open	(None) Among huckleberries & yellow peas equal height.
132	R. vis.	15	1.3	1.0	3.0	2.0	Light	(None) General vegetation equal.
133	R. vis.	15	2.5	2.0	6.0	4.0	Light	(None) General vegetation lower.
134	R. vis.	15	1.5	1.0	6.0	4.0	Light	(None) General vegetation equal.
135	R. vis.	15	1.0	1.0	3.0	3.0	Open	(None) General vegetation equal.
136	R. vis.	15	2.0	2.0	6.0	6.0	Light	(SE.) General vegetation equal.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
137	R. vis.	15	3.0	3.0	12.0	12.0	Medium	(E.) In W. edge of Salix bush.
138	R. vis.	15	1.5	1.0	3.0	2.0	Medium	(All ±) In thimble-berries.
139	R. vis.	15	3.0	3.0	5.0	4.0	Heavy	(All ±) In Salix (Not dense)
140	R. vis.	15	2.0	1.0	4.0	2.0	Heavy	(All ±) In dense Ceanothus.
141	R. vis.	15	1.8	1.5	2.5	1.5	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
142	R. vis.	15	1.5	1.0	1.5	1.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
143	R. vis.	15	1.5	1.0	1.5	1.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
144	R. vis.	15	2.0	2.0	2.0	2.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
146	R. vis.	15	3.0	3.0	7.0	7.0	Heavy	(All ±) Under open Ceanothus. All in radius of 12 or 15'.
147	R. vis.	15	2.0	2.0	4.0	4.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
145	R. vis.	15	1.0	1.0	1.0	1.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
148	R. vis.	15	1.0	1.0	1.0	1.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
149	R. vis.	15	1.0	1.0	1.0	1.0	Heavy	(All ±) Under dense Ceanothus. All in radius of 12 or 15'.
154	R. vis.	15	1.0	1.0	2.5	1.0	Heavy	(All ±) Under dense Ceanothus. Old bush broken off.
155	R. vis.	15	2.0	1.5	3.0	2.0	Medium	(All ±) Under open Ceanothus.

BLOCK - 1 (Continued) 9

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
156	R. vis.	15	2.0	2.0	8.0	7.0	Medium	(All ±) Under open Ceanothus.
157	R. vis.	15	2.5	2.5	5.0	5.0	Medium	(All ±) In willow clump.
158	R. vis.	15	2.0	2.0	4.5	4.0	Medium	(All ±) In open willow clump.
159	R. vis.	15	3.5	3.0	3.5	3.0	Heavy	(All ±) In dense snow brush and Maple.
160	R. vis.	15	3.0	2.5	6.0	5.0	Heavy	(All ±) In dense snow brush and Maple.
161	R. vis.	15	1.0	1.0	1.0	1.0	Light	(EW) Between stump and Salix in opening.
163	R. vis.	15	1.0	0.3	1.0	0.3	Heavy	(All ±) Under boughs of W.P. 8".
164	R. vis.	15	1.5	1.0	2.0	1.5	Open	(None) Above surrounding ground cover.
165	R. vis.	16	2.8	2.5	3.0	2.5	Light	(None ±) In opening between bushes of equal height.
166	R. vis.	16	1.0	0.8	1.0	0.8	Light	(SW) Just N.W. of Salix 3' High.
167	R. vis.	16	2.0	2.0	6.0	5.0	Light	(None) General vegetation 12".
168	R. vis.	16	1.3	1.0	1.3	1.0	Medium	(E.) General vegetation 3'- In opening between.
169	R. vis.	16	1.0	1.0	2.0	1.5	Heavy	(SE.) General vegetation Ceanothus 4'.
170	R. vis.	16	1.3	1.0	1.0	1.0	Medium	(All ±) General vegetation Ceanothus 4'.
171	R. vis.	16	5.0	5.0	50.0	40.0	Medium	(None ±) General vegetation open Ceanothus 4'. One prong of large bush cut off last yr. and this one left. Old prongs now sprouting again profusely

BLOCK - 1 (Continued) 10

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
172	R. vis.	16	0.8	0.5	0.8	0.5	Light	(None)
175	R. vis.	16	1.5	1.2	6.0	5.0	Open	(None) No excuse.
177	R. vis.	16	2.5	2.0	5.0	4.0	Open	(None) No excuse.
178	R. vis.	16	1.5	1.0	3.0	1.5	Open	(None) Bare ground.
179	R. vis.	16	2.0	2.0	4.0	3.0	Open	(None) No excuse.
181	R. vis.	16	3.5	3.5	4.0	4.0	Heavy	(All ±) In dense Ceanothus.
184	R. vis.	16	0.5	0.3	0.5	0.3	Heavy	(All ±) In dense Ceanothus.
186	R. vis.	16	2.0	1.5	3.0	2.0	Open	(None) No excuse.
187	R. vis.	16	1.5	1.0	3.0	2.0	Light	(None) No excuse.
188	R. vis.	16	0.8	0.5	0.8	0.5	Light	(None) Hard to see.
189	R. vis.	16	0.9	0.5	0.9	0.5	Light	(None) Hard to see.
193	R. vis.	16	0.6	0.5	0.8	0.6	Light	(SW) Under partial shade Prunus brush.
194	R. vis.	16	0.4	0.3	0.5	0.3	Medium	(S-SW) Under shade of Prunus brush.
195	R. vis.	16	3.0	3.0	12.0	11.0	Medium	(None) In open willow clump.
196	R. vis.	16	2.5	2.0	5.0	4.0	Medium	(All ±) In open willow clump.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
197	R. vis.	16	1.5	1.5	1.5	1.5	Medium	(None) Under very open W. P. 5'.
199	R. vis.	16	2.5	2.0	3.5	2.5	Light	(None) Old brush cut off-all but one branch - cut branch sprouted also.
201	R. vis.	16	1.5	1.5	3.0	2.5	Light	(S) Small Salix just south of it.
202	R. vis.	16	2.0	2.0	8.0	7.0	Light	(N) Small Salix just north of it.
205	R. vis.	16	1.5	1.0	1.5	1.0	Medium	(S) General vegetation slightly higher.
207	R. vis.	16	1.3	1.0	2.5	2.0	Heavy	(None) Just above swamp on north face in brush.
210	R. vis.	16	2.0	2.0	3.0	3.0	Heavy	(S.) Just above swamp on north facing bank.
213	R. vis.	16	2.5	2.5	5.0	5.0	Heavy	(E.) In W. side of Ceanothus bush.
214	R. vis.	16	3.5	3.0	7.0	4.0	Light	(S.) At water's edge on N. facing bank.
215	R. vis.	16	3.0	2.5	5.0	4.0	Light	(S.) At water's edge on N. facing bank.
216	R. vis.	16	3.0	3.0	30.0	28.0	Heavy	(NE.) In SW. part of Salix-Acer clump.
217	R. vis.	17	1.0	0.8	1.0	0.8	Light	(None) General vegetation equal height, but not dense. 10' circle.
218	R. vis.	17	1.5	1.3	2.0	1.5	Light	(None) general vegetation equal height, but not dense. 10' circle.
219	R. vis.	17	1.0	0.7	1.0	0.7	Heavy	(S.) General vegetation 2'-4'. 10' circle.
220	R. vis.	17	1.5	1.3	1.8	1.5	Light	(None) General vegetation equal height - not dense 10' circle.

BLOCK - 1 (Continued) 12

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
221	R. Vis.	17	1.2	0.8	1.2	0.8	Medium	(None ±)General vegetation 2' - 10' circle.
222	R. vis.	17	3.0	3.0	5.0	4.0	Light	(None ±)General vegetation 1' - 10' circle.
223	R. vis.	17	4.0	4.0	8.0	8.0	Light	(W-NW.) S.E. edge of Maple bush. Other vegetation 5" - 12".
224	R. vis.	17	3.5	3.0	15.0	13.0	Medium	(SW.) In open willow clump.
225	R. vis.	17	1.5	1.0	1.5	1.0	Medium	(E.) In huckleberries equal height.
226	R. vis.	17	2.5	2.5	6.0	6.0	Medium	(NE.) In SW. edge Maple bush.
227	R. vis.	17	2.0	2.0	4.0	3.0	Medium	(NW.) In SE. edge same Maple bush.
230	R. vis.	17	3.5	3.0	6.0	5.0	Light	(W.) 3' from large bush cut off 1922.
234	R. vis.	17	1.0	0.5	1.0	0.5	Light	(None) Semi-open.
237	R. vis.	17	1.3	1.3	5.0	5.0	Open	(None) No excuse.
239	R. vis.	17	1.0	1.0	4.0	3.0	Medium	(E.) Edge of bare trail.
240	R. vis.	17	2.0	2.0	3.0	3.0	Medium	(None ±) In low snow brush. 8" apart.
241	R. vis.	17	1.3	1.3	1.3	1.3	Heavy	(All ±) In low snow brush. 8" apart.
242	R. vis.	17	0.5	0.4	0.5	0.4	Heavy	(All ±) In dense snow brush.
243	R. vis.	17	1.3	1.0	1.3	1.0	Light	(None) General vegetation equal height. 8' apart.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
244	R. vis.	17	0.4	0.3	0.4	0.3	Heavy	(None) General vegetation 3 times height, 3' apart.
245	R. vis.	17	0.7	0.5	0.7	0.5	Light	(None) General vegetation 3 times height. 3' apart.
246	R. vis.	17	2.0	1.8	2.0	1.8	Medium	(None) General vegetation 25' on N. edge large Cedar stump. 4' apart.
248	R. vis.	17	0.8	0.5	0.8	0.5	Medium	(W.) E. edge of snow brush.
249	R. vis.	17	1.5	1.2	3.0	2.5	Light	(SE.) N.W. side of cherry-Maple clump.
250	R. vis.	18	1.2	0.8	1.5	1.0	Open	(None) 6' W. of W. edge Plot 2. General vegetation 3" high
251	R. vis.	18	1.5	1.2	4.0	3.0	Open	(None) General vegetation 1/2 Height. 3' diameter.
254	R. vis.	18	0.8	0.5	0.8	0.5	Light	(NE.) 2' from old cut bush. 3' diameter.
255	R. vis.	18	1.0	1.0	1.5	1.5	Open	(None) 1' from old cut bush. 3' diameter.
256	R. vis.	18	0.4	0.2	0.4	0.2	Open	(S.) 5' from old cut bush.
257	R. vis.	18	0.4	0.2	0.4	0.2	Light	(None) On bare patch of ground. 3" apart.
258	R. vis.	18	0.4	0.2	0.4	0.2	Light	(None) On bare patch of ground. 3" apart.
259	R. vis.	18	1.6	1.0	1.6	1.0	Light	(W.) General vegetation equal.
260	R. vis.	18	1.5	1.0	2.5	2.5	Medium	(S.) On N. edge of Huckleberry bush.
261	R. vis.	18	2.5	2.0	3.5	2.0	Medium	(N.) On S. edge of Salix (on W. edge Plot 1) One stalk of cut bush.

BLOCK - 1 (Continued) 13.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
262	R. vis.	18	1.5	1.0	1.5	1.0	Medium	(None ±) 12' SW. of NW. Cor. Plot 1.
265	R. vis.	18	1.0	0.7	1.0	0.7	Medium	(All ±) s' Sw. of 264. In heavy Ceanothus.
267	R. vis.	18	2.8	2.5	4.0	3.0	Medium	(E.) On E. edge of big hole covered with logs. All 3' wide.
268	R. vis.	18	2.5	2.0	5.0	4.0	Medium	(E.) On E. edge of big hole covered with logs. All 3' wide.
270	R. vis.	18	0.8	0.5	0.8	0.5	Medium	(E-S) 3' S of 267-9.
273	R. vis.	18	0.5	0.3	0.5	0.3	Medium	(None) Hard to see.
276	R. vis.	18	1.0	0.8	1.5	1.2	Open	(None) General vegetation
278	R. vis.	18	1.5	1.0	3.0	2.0	Medium	(S.) N. edge Salix clump.
279	R. vis.	18	1.0	0.6	2.0	1.0	Medium	(All ±) Opening between Salix 6" apart.
280	R. vis.	18	0.6	0.5	0.6	0.5	Medium	(All ±)Opening between Salix 6" apart.
281	R. vis.	18	1.8	1.5	4.0	3.0	Medium	(None) In big bare opening. No excuse.
282	R. vis.	18	1.0	1.0	1.3	1.0	Medium	(None) General vegetation slightly higher.
283	R. vis.	17	1.3	1.0	2.0	1.5	Heavy	(N - W) In Salix 25' NW. of upper spring.
285	R. vis.	19	0.8	0.3	0.8	0.3	Medium	(S.) On steep N. face of stump hole. Same Hole.
284	R. vis.	19	2.5	2.5	3.5	2.5	Light	(None) In open brush. Easy.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
286	R. vis.	19	3.0	2.5	5.0	4.0	Heavy	(W.) On steep E. face of stump hole. Same hole.
287	R. vis.	19	1.5	1.0	1.5	1.0	Medium	(SW.) On steep NE. face of stump hole. Same hole
288	R. vis.	19	1.5	1.5	2.0	1.5	Light	(None) General vegetation 8". in 4' circle.
289	R. vis.	19	0.5	0.3	0.5	0.3	Open	(None) Bare around it. In 4' circle.
290	R. vis.	19	0.6	0.3	0.6	0.3	Open	(S.) N. edge of stump (Inside).
291	R. vis.	19	0.6	0.4	0.6	0.4	Open	(SE.) N.W. edge of stump bare ground.
293	R. vis.	19	2.5	2.2	4.0	3.0	Light	(S.) With Salix equal height.
298	R. vis.	19	1.0	0.8	1.0	0.8	Open	(None) Opening between brush. 8' W. of draw.
302	R. vis.	19	2.5	2.5	2.5	2.5	Medium	(S.) In N. edge snow brush.
305	R. vis.	19	1.0	0.6	1.0	0.6	Medium	(None) 3' E and 18' S of N.E. cor. Plot 1.
306	R. vis.	19	0.3	0.2	0.3	0.2	Medium	(W-N) In Plot 2. 2' apart.
307	R. vis.	19	0.4	0.4	0.4	0.4	Light	(W.) In Plot 2. 2' apart.
308	R. vis.	20	3.5	3.5	15.0	14.0	Open	(None) Very easy - 10' S. of old E. W. road.
309	R. vis.	20	1.5	1.0	5.0	2.5	Open	(None) Very easy - 30' S. of old E. W. road.
310	R. vis.	20	1.0	0.6	1.0	0.6	Open	(None) Very easy - 28' S. of old E. W. road.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
311	R. vis.	20	1.0	0.6	1.0	0.6	Open	(None) Very easy-8.5'SW.ofSE. Cor.Plot 2,3" from driven stake on plot boundary.
312	R. vis.	20	1.0	0.5	3.0	1.5	Open	(None) Practically bare ground.
313	R. vis.	20	1.0	0.8	4.0	2.0	Open	(None) Practically bare ground.
316	R. vis.	20	0.5	0.5	0.5	0.5	Medium	(None) Average vegetation 12". 4" apart.
317	R. vis.	20	0.5	0.5	0.5	0.5	Medium	(None) Average vegetation 12". 4" apart.
320	R. vis.	20	0.4	0.2	0.4	0.2	Open	(None) 2 yr. old.
322	R. vis.	20	0.5	0.5	1.0	0.8	Light	(None) Easily missed.
327	R. vis.	20	0.5	0.1	0.5	0.1	Open	(W.) In arch cedar stump 40' W. of draw.
330	R. vis.	20	2.0	1.5	7.0	5.0	Medium	(N.) In open bare spot.
331	R. vis.	20	0.6	0.4	0.6	0.4	Heavy	(All ±) Under snow brush and Salix 6" apart.
332	R. vis.	20	1.0	0.8	1.0	0.8	Heavy	(All ±) Under snow brush and Salix. 6" apart.
333	R. vis.	20	1.0	0.8	1.0	0.8	Medium	(W-SW) Under Salix & Acer.
335	R. vis.	20	2.0	2.0	2.0	2.0	Medium	(W.) E. side snow brush.
336	R. vis.	20	1.0	1.0	1.0	1.0	Medium	(N.) Under Mixed brush.
337	R. vis.	20	0.6	0.5	0.6	0.5	Medium	(None) Under mixed brush.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes.
338	R. vis.	20	0.6	0.5	0.6	0.5	Medium	(W.) Under mixed brush.
342	R. vis.	20	0.5	0.4	0.5	0.4	Medium	(None) 18" vegetation.
343	R. vis.	20	3.0	2.5	6.0	4.0	Open	(None) 12" vegetation.
344	R. vis.	20	1.0	0.8	2.0	1.0	Open	(None) 12" vegetation.
3	R. vis.	21	1.5	1.0	1.5	1.0	Medium	(None) General vegetation equal 9'SW.of SE.Cor.Plot 1 on SE.boundary 8" apart.
4	R. vis.	21	2.5	2.0	4.0	3.0	Medium	(None) General vegetation equal 18".9'SW.of SE. Cor.Plot 1 on SE.boundary.8" apart.
5	R. vis.	21	1.7	1.4	1.7	1.4	Light	(None) General vegetation equal 4' N. of #4.
6	R. vis.	21	1.0	0.6	1.0	0.6	Light	(None) General vegetation equal 28'W.&10'N. of SE.Cor. Plot 1. In Salix.
7	R. vis.	21	0.6	0.3	0.6	0.3	Light	(None) Practically no vegetation 20' E and 4' N. of SW. Cor. 1.
8	R. vis.	21	1.0	0.7	1.0	0.7	Heavy	(None) 8' W. of SW. Cor. Plot 1
10	R. vis.	21	2.0	2.0	4.5	4.0	Medium	(SE.) 12' NW. of 9.
13	R. vis.	21	2.3	2.0	3.0	2.5	Open	(None) 3' E. of draw. 6' apart.
14	R. vis.	21	0.5	0.3	0.8	0.4	Medium	(None) 4' E. of draw. 6' apart.
15	R. vis.	21	2.5	2.0	4.0	3.0	Light	(None) 3' E. of draw. 6' apart.
16	R. vis.	21	0.6	0.5	0.6	0.5	Light	(None) 20' W. of draw. 6' N. of 17.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
17	R. vis.	21	2.0	2.0	4.0	3.0	Light	(None) 20' W. of draw. In 3' hole.
18	R. vis.	21	2.5	2.0	5.0	4.0	Light	(None) 15' W. of 17. 2' apart.
19	R. vis.	21	1.5	1.5	3.5	3.0	Light	(None) 15' W. of 17. 2' apart.
20	R. vis.	21	1.0	0.8	2.0	1.0	Open	(None) 60' W. of draw,
21	R. vis.	21	0.3	0.3	0.3	0.3	Open	(None)No other vegetation with in several feet.Clump of Seedlings 6" across.80'W.of draw in open bare spot beside 30"log
22	R. vis.	21	0.7	0.6	1.0	0.8	Open	(None)No other vegetation with in several ft.Clump of seedlings 6" across.80'W.of draw in open bare spot beside 30"log
23	R. vis.	21	0.5	0.4	0.5	0.4	Open	(None)No other vegetation with in several ft.Clump of seedlings 6" across.80'W.of draw in open bare spot beside 30"log
24	R. vis.	21	0.4	0.4	0.4	0.4	Open	Ditto
25	R. vis.	21	0.4	0.4	0.4	0.4	Open	Ditto
26	R. vis.	21	0.5	0.4	0.5	0.4	Open	Ditto
27	R. vis.	21	0.6	0.5	0.6	0.5	Open	Ditto
28	R. vis.	21	0.6	0.5	0.6	0.5	Open	Ditto
29	R. vis.	21	0.8	0.7	0.8	0.7	Open	Ditto

BLOCK - 1 (Continued) 18

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
30	R. vis.	21	1.0	0.8	1.5	1.2	Open	(None) No other vegetation within several feet. Clump of seedlings 6" across. 80' W. of draw in open bare spot beside 30" log.
31	R. vis.	21	0.7	0.5	0.7	0.5	Open	(None) No other vegetation within several feet. Clump of seedlings 6" across. 80' W. of draw in open bare spot beside 30" log.
33	R. vis.	20	1.0	1.0	1.0	1.0	Medium	(None) 5' Se. of W. spring.
34	R. vis.	22	1.3	1.0	2.0	1.5	Open	(None) 2' S. of EW. trail and 25' N. of EW. draw.
36	R. vis.	22	1.0	1.0	1.5	1.0	Light	(None) 30' W. of draw 30' N. of draw.
38	R. vis.	22	4.0	4.0	10.0	10.0	Medium	(NE) In open scattering Salix. 2' from 37.
39	R. vis.	22	1.0	0.8	1.5	1.2	Open	(SW) In bare area WS. of Maple clump. 6" apart. 6' NE 37-38.
40	R. vis.	22	0.5	0.5	0.5	0.5	Medium	(SW) In edge bare area WS. of Maple clump. 6" apart. 6' NE. 37-38.
42	R. vis.	22	0.6	0.4	2.0	0.8	Open	(None) General vegetation equal. 15' S. of road.
43	R. vis.	22	1.5	1.0	1.5	1.0	Light	(None) General vegetatinn equal. 15' S. of road.
44	R. vis.	22	1.5	0.8	4.0	2.5	Open	(None) General vegetation lower. All in 5' circle.
45	R. vis.	22	1.8	1.5	3.0	2.0	Open	(None) General vegetation lower. All in 5' circle.
49	R. vis.	22	1.0	0.8	1.5	1.0	Open	(None) General vegetation 3".
54	R. vis.	23	2.0	1.5	4.0	3.0	Heavy	(N-NE) In S. part dense Salix.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
56	R. vis.	23	2.0	2.0	6.0	5.0	Open	(None)In old trail. General vegetation 8".
57	R. vis.	23	0.8	0.6	0.8	0.6	Medium	(None)General vegetation 30" - not dense, 30" E. big log pile.
58	R. vis.	23	2.5	2.0	6.0	5.0	Light	(None)General vegetation 18" -15' W. of log pile.
59	R. vis.	23	1.2	0.9	1.2	0.9	Medium	(None)General vegetation equal 10' W. of #58.
60	R. vis.	23	1.5	1.0	1.5	1.0	Light	(None)General vegetation 12"- 10' W. of #58.
61	R. vis.	23	2.5	2.0	6.0	5.0	Light	(None)General vegetation 12 to 24" open. 30' S. of SW. Cor. of plot 1.
62	R. vis.	23	0.8	0.6	0.8	0.6	Heavy	(None)General vegetation 24" - 30' S. of SW Cor. Plot 1.
63	R. vis.	23	2.0	1.5	2.0	1.5	Heavy	(None) General vegetation 30" dense snow brush. 30' S. of SW. cor. Plot 1.
64	R. vis.	23	3.3	3.3	6.0	6.0	Open	(None)Part of large bush mostly dead with 50' stem. Mostly bare ground.
65	R. vis.	23	0.8	0.7	0.8	0.7	Heavy	(N-E) In Salix-snow brush clump. 12' EW. of draw.
66	R. vis.	23	1.5	1.0	2.5	1.5	Light	(W-SW)In east edge open Salix clump. 6'W. of draw
68	R. vis.	24	2.5	2.0	4.0	3.0	Light	(None)In 18" squaw mat. 1' from fence. Opp. big double Stump.
69	R. vis.	24	2.5	2.5	4.0	4.0	Light	(None) On E. edge squaw mat. 8' from fence. Opp. big double stump.
70	R. vis.	24	2.5	1.5	5.0	4.0	Heavy	(None) In snow brush 7' from fence. 10' SW. big double Stump.
71	R. vis.	24	1.5	1.2	3.0	2.0	Open	(None) In bare spot several feet across. In draw.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
72	R. vis.	24	1.5	1.0	1.5	1.0	Heavy	(All ±) In dense mixed brush.
73	R. vis.	24	2.5	2.5	4.5	4.0	Light	(SE) NW. side dense snow brush. SW. Cor. Plot 1 30' Left.
76	R. vis.	24	4.0	3.5	5.0	4.5	Heavy	(All ±) In dense snow brush 15' S. of lot pile.
78	R. vis.	24	1.0	1.0	1.0	1.0	Medium	(None ±) General vegetation equal 25' SE. log pile.
80	R. vis.	24	1.0	0.4	1.0	0.4	Medium	(None ±) General vegetation 18". In 12' circle.
81	R. vis.	24	2.8	2.8	5.0	5.0	Medium	(None ±) General vegetation 3' broken off flush.
83	R. vis.	24	1.5	1.0	5.0	4.0	Light	(None ±) General vegetation 18". broken off 3" high.
84	R. vis.	24	1.0	0.3	3.0	0.3	Light	(None ±) General vegetation 12". Broken off 3" high.
85	R. vis.	24	0.6	0.5	0.8	0.6	Medium	(None ±) General vegetation 12".
87	R. vis.	24	1.0	0.6	1.4	1.0	Heavy	(All ±) 10' circle. General vegetation 2'.
89	R. vis.	24	1.0	0.6	2.0	0.6	Open	(None) Old bush broken off 6" high. 10' circle.
90	R. vis.	24	2.5	2.5	5.0	5.0	Medium	(E.) W. edge Salix. 10' circle.
91	R. vis.	24	1.5	1.0	5.0	4.0	Light	(None) General vegetation equal.
92	R. vis.	24	2.0	2.0	5.0	4.0	Open	(None) General vegetation 8". No excuse.
93	R. vis.	24	1.0	0.5	2.0	1.0	Medium	(S.) Old bush broken off 2 yrs. ago.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
94	R. vis.	24	1.2	1.0	3.0	2.0	Open	(None) General vegetation equal.
98	R. vis.	25	2.0	1.5	3.0	2.0	Medium	(None) In opening between brush.
102	R. vis.	25	0.5	0.2	2.0	1.0	Light	(W.) Broken off 2 years ago.
103	R. vis.	25	1.8	2.0	6.0	5.0	Medium	(SW.) With small Salix.
105	R. vis.	25	2.0	1.0	8.0	3.0	Medium	(NW) Most of bush cut off but old branches left,& old stump sprouting.All within 24"
106	R. vis.	25	0.5	0.3	1.0	0.3	Heavy	(All ±) In open Salix. All within 24".
107	R. vis.	25	1.0	0.6	1.0	0.6	Heavy	(All ±) In open Salix. All within 24".
109	R. vis.	25	2.5	2.3	5.0	4.0	Medium	(E.) In Salix.
110	R. vis.	25	1.3	1.0	2.0	1.5	Light	(None) General vegetation equal.
111	R. vis.	25	0.5	0.2	0.5	0.2	Heavy	(None) Old bush died back within 2" of ground.
112	R. vis.	25	1.2	0.8	1.2	0.8	Light	(S.) N. side Salix brush 8' circle.
113	R. vis.	25	1.5	1.0	2.0	1.5	Light	(None ±) N. side Salix brush. 8' circle.
114	R. vis.	25	0.6	0.4	0.6	0.4	Light	(None ±) In open.
117	R. vis.	25	0.4	0.3	1.0	0.3	Medium	(SE.) Broken last year,about 6" from ground. Died back.
119	R. vis.	25	2.0	1.5	2.0	1.5	Open	(None) Above all adjoining vegetation.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
120	R. vis.	25	2.0	2.0	5.0	4.0	Light	(S-SW) In NE. shade Salix.
121	R. vis.	25	2.0	2.0	4.0	3.0	Light	(SW) NE. Shade of Maple bush.
122	R. vis.	25	1.5	1.0	2.5	2.0	Heavy	(SW-S)On bank along SW. On border of Bog.
125	R. vis.	26	1.5	1.5	8.0	4.0	Light	(None) In large open between bushes.
126	R. vis.	26	2.8	2.5	6.0	5.0	Heavy	(W-E) Between Salix & Acer.
127	R. vis.	26	2.0	1.2	4.0	3.0	Medium	(SE-NW)Between Salix & W.P.
128	R. vis.	26	1.5	1.0	3.0	2.0	Heavy	(S-SW) under snow brush.
129	R. vis.	26	1.2	1.0	1.2	1.0	Light	(N.) At S. edge of snow brush
131	R. vis.	26	0.8	0.5	0.8	0.5	Heavy	(All ±) Dense snow brush.
132	R. vis.	26	0.8	0.5	0.8	0.5	Light	(E.) Between bushes snow brush
134	R. vis.	26	2.0	1.5	2.0	1.5	Light	(None) General vegetation equal. 6' circle.
135	R. vis.	26	2.0	2.0	10.0	9.0	Light	(None) General vegetation equal. 6' circle.
136	R. vis.	26	2.0	2.0	2.0	2.0	Light	(None) General vegetation equal. 6' circle.
137	R. vis.	26	1.5	1.5	3.0	3.0	Medium	(E.) General vegetation equal. 6' circle.
138	R. vis.	26	0.7	0.5	0.7	0.5	Open	(None) General vegetation lower. 6' circle.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
139	R. vis.	26	3.0	2.5	6.0	5.0	Heavy	(S-W) Edge Salix & Snow brush.
141	R. vis.	26	3.0	2.0	4.0	3.0	Open	(None) Above all vegetation.
142	R. vis.	26	3.0	2.0	5.0	4.0	Medium	(S.) NW. edge Salix.
143	R. vis.	26	0.8	0.7	2.0	1.0	Heavy	(All ±) 3' vegetation.
146	R. vis.	26	1.0	1.0	1.0	2.0	Heavy	(All ±) Old bush died down 2 years ago - sprouted - 1' from cut bush.
148	R. vis.	26	2.5	2.0	4.0	3.0	Light	(None ±) In old trail.
149	R. vis.	26	1.5	1.0	2.0	1.0	Light	(None ±) In old trail.
150	R. vis.	26	4.0	3.5	12.0	10.0	Heavy	(S.) In dense Salix.
153	R. vis.	26	1.0	0.5	1.0	0.5	Heavy	(S-W) Under Salix.
154	R. vis.	26	0.8	0.3	0.8	0.3	Medium	(None) 18" vegetation. 3".
155	R. vis.	26	0.5	0.4	1.0	0.6	Medium	(None) 18" vegetation. 3".
156	R. vis.	26	1.5	1.0	2.5	2.0	Medium	(None) 18" vegetation.
158	R. vis.	27	1.5	1.5	5.0	4.0	Open	(None) General vegetation 6".
161	R. vis.	27	1.0	0.5	1.0	0.5	Medium	(E.) Under edge W.P.
162	R. vis.	27	2.5	1.5	6.0	4.0	Light	(S.) Under edge W.P.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
163	R. vis.	27	1.0	0.8	3.0	1.0	Open	(None) In old trail.
164	R. vis.	27	0.5	0.2	1.0	0.5	Medium	(N.) 3' S. of Salix clump.
165	R. vis.	27	1.2	0.6	2.0	0.6	Light	(None) 10' W. of 164.
166	R. vis.	27	0.5	0.3	0.5	0.3	Heavy	(None ±) 24" vegetation.
167	R. vis.	27	1.5	1.0	2.0	1.5	Medium	(None ±) 24" vegetation.
168	R. vis.	27	3.0	3.0	10.0	8.0	Heavy	(All ±) Snow brush and Salix.
169	R. vis.	27	1.5	1.0	3.0	2.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
170	R. vis.	27	3.0	2.5	12.0	10.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
171	R. vis.	27	4.0	4.0	15.0	14.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
172	R. vis.	27	2.5	2.0	7.0	6.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
173	R. vis.	27	3.5	3.0	10.0	8.0	Heavy	(All ±) Salix. All in one big broup in 10' circle.
174	R. vis.	27	5.0	5.0	95.0	80.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
175	R. vis.	27	4.0	4.0	45.0	40.0	Heavy	(All ±) Salix. All in one big group in 10' circle.
176	R. vis.	27	1.5	1.0	1.5	1.0	Open	(None) Opening in brush. L. 5' - 25' S. of log pile.
177	R. vis.	27	1.5	1.0	2.5	2.0	Open	(None) Opening in brush. L5' - 25' S. of log pile.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
178	R. vis.	27	1.8	1.0	3.0	2.0	Heavy	(S.) Salix dense. L 5' - 25' S. of log pile.
179	R. vis.	27	1.0	0.8	4.0	3.0	Light	(None ±) Huckleberry 24".
180	R. vis.	27	0.8	0.5	1.0	0.6	Medium	(S.) In small opening between buckbrush.
181	R. vis.	27	0.7	0.4	0.7	0.4	Medium	(S.) With small cherry & willow.
183	R. vis.	27	2.5	2.5	5.0	5.0	Heavy	(All ±) In dense snow brush.
184	R. vis.	27	3.5	3.5	6.0	6.0	Heavy	(All ±) In dense snow brush and salix.
185	R. vis.	27	1.0	0.6	1.0	0.6	Heavy	(All ±) In dense snow brush and salix.
186	R. vis.	27	3.0	2.5	5.0	4.0	Medium	(None) Between clump of brush 30' S. of draw just E. of large cedar stump.
187	R. vis.	27	2.0	1.5	2.0	1.5	Light	(None) General vegetation same. 30' S. of draw just E. of large cedar stump.
188	R. vis.	27	0.8	0.3	3.0	0.5	Heavy	(All ±) Larger bush broken off but found stem recovered. 30' S. of draw just E. of large CS
189	R. vis.	27	3.0	2.5	3.0	2.5	Open	(None) General vegetation lower. 30' S. of draw just E. of large cedar stump.
191	R. vis.	27	0.4	0.2	0.4	0.2	Heavy	(All ±) Vegetation 3'. 30' S. of draw just E. of large cedar stump.
192	R. vis.	27	0.2	0.1	0.2	0.1	Heavy	(All ±) Vegetation 3'. 30' S. of draw just E. of large cedar stump.
193	R. vis.	27	0.5	0.5	0.5	0.5	Heavy	(All ±) Vegetation 3' 30' S. of draw just E. of large cedar stump.
194	R. vis.	27	0.8	0.6	0.8	0.6	Heavy	(All ±) Vegetation dense.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
195	R. vis.	27	0.5	0.3	0.5	0.3	Medium	(All ±) Open 12" vegetation.
197	R. vis.	27	0.6	0.5	0.6	0.5	Heavy	(All ±) Under W. P. tree. 5' circle. No excuse.
198	R. vis.	27	2.5	2.5	8.0	6.0	Light	(E.) General vegetation 12". 5' circle. No excuse.
199	R. vis.	27	0.6	0.5	0.6	0.5	Medium	(None) In very open Salix. 5' circle. No excuse.
200	R. vis.	27	1.3	1.3	4.0	4.0	Light	(None) In very open Salix. 5' circle. No excuse.
201	R. vis.	27	1.0	0.8	3.0	2.0	Light	(None) In very open Salix. 5' circle. No excuse.
202	R. vis.	27	1.5	1.2	1.5	1.2	Light	(None) In very open 12" vegetation.
204	R. vis.	28	1.2	1.0	1.2	1.0	Light	(S.) N. side of very open maple.
205	R. vis.	28	0.2	0.1	0.2	0.1	Heavy	(All ±) 7' N. of #204.
206	R. vis.	28	1.0	0.5	1.0	0.5	Heavy	(E.) Under small Salix on steep NW. face 2' W. of dead 3' W. P.
208	R. vis.	28	2.0	2.0	2.0	2.0	Heavy	(S.E.) In open Salix clump.
209	R. vis.	28	0.8	0.6	0.8	0.6	Heavy	(S.W.) In heavy brush mixed.
210	R. vis.	28	0.8	0.6	1.2	1.0	Heavy	(All ±) In heavy brush mixed. 2' circle.
211	R. vis.	28	0.2	0.1	0.2	0.1	Heavy	(All ±) In heavy brush mixed. 2' circle.
212	R. vis.	28	0.8	0.5	0.8	0.5	Heavy	(All ±) In heavy brush mixed. 2' circle.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
216	R. vis.	28	2.0	2.0	3.0	2.0	Heavy	(All ±) Heavy mixed brush.
217	R. vis.	28	1.0	0.8	1.0	0.8	Heavy	(All ±) Heavy mixed brush.
218	R. vis.	28	2.0	1.5	3.0	2.0	Medium	(None) In small Salix.
219	R. vis.	28	1.5	1.0	1.5	1.0	Light	(None) General vegetation equal.
221	R. vis.	28	2.0	2.0	6.0	5.0	Open	(S.) On S. edge of bare opening.
223	R. vis.	28	2.5	2.5	6.0	5.0	Light	(None) In opening.
224	R. vis.	28	1.0	1.0	5.0	4.0	Heavy	(SE.) Under 6' W.P.
226	R. vis.	28	2.0	2.0	6.0	5.0	Heavy	(All) Under dense snow brush.
227	R. vis.	28	3.5	3.0	8.0	6.0	Heavy	(All) Under dense snow brush.
229	R. vis.	28	1.0	0.7	2.0	4.0	Open	(None) In 6" vegetation.
1	R. vis.	29	1.5	0.8	1.5	0.8	Light	(E-W) In opening between bushes.
2	R. vis.	29	1.0	0.3	1.5	0.5	Light	(None) In opening between bushes.
4	R. vis.	29	3.0	2.8	4.0	3.5	Medium	(None) In opening between heavy mixed bushes.
5	R. vis.	29	4.0	3.0	7.0	5.0	Heavy	(S.) In N. side heavy brush.
6	R. vis.	29	1.5	1.0	1.5	1.0	Heavy	(All±) In d ense Ceanothus 16' SW of SW. Cor. Plot 3.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
7	R. vis.	29	1.0	0.5	1.0	0.5	Heavy	(All ±) Under 5' W. P.
9	R.vis.	29	2.0	1.5	3.0	2.0	Medium	(None ±) In opening in brush. 3' circle.
10	R. vis.	29	2.0	2.0	4.0	3.0	Medium	(None ±) In opening in brush 3' circle.
11	R. vis.	29	2.5	2.0	6.0	4.0	Medium	(None ±) In opening in brush. 3' circle.
12	R. vis.	29	2.5	2.5	5.0	5.0	Light	(None ±) In opening in brush. 3' apart 20' W. of 9-10-11.
14	R. vis.	29	3.0	2.5	7.0	6.0	Medium	(W.) Under SE. edge of snow brush.
15	R. vis.	29	0.8	0.5	0.8	0.5	Light	(SW.) Under N. edge Maple 3' apart in (Strip 28)
16	R. vis.	29	2.0	2.0	7.0	6.0	Light	(SW.) Under N. edge Salix. 3' apart in (Strip 28)
17	R. vis.	29	3.0	2.5	15.0	17.0	Open	(None) In bare area. 3'-20' E. of upturned stump.
18	R. vis.	29	0.9	0.6	1.3	1.0	Open	(None) In bare area. 3'-20' E. of upturned stump.
19	R. vis.	29	0.8	0.5	0.8	0.5	Heavy	(SE.) In Huckleberry bush.
20	R. vis.	29	2.0	1.5	2.0	1.5	Open	(None) Bare ground.
21	R. vis.	29	0.6	0.4	0.6	0.4	Medium	(E.) W.edge huckleberries 3' circle. Paper trail on bush directly above 6 of this group.
22	R. vis.	29	0.6	0.4	0.6	0.4	Medium	Ditto

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
23	R. vis.	29	0.6	0.4	0.6	0.4	Medium	(E.) W. edge Huckleberries.3' circle. Paper trail on bush directly above 6 of this group
24	R. vis.	29	0.8	0.6	0.8	0.6	Light	(None) Open area. 3' circle. Paper trail on bush directly above 6 of this group.
25	R. vis.	29	0.0	0.7	1.0	0.7	Light	Ditto
29	R. vis.	29	0.5	0.2	0.5	0.2	Light	(E.) In light Salix 4' W. of upturned stump.
30	R. vis.	29	0.5	0.3	0.5	0.3	Medium	(S.W.) Under 6' W. P. & snow brush 12' N.W. of upturned stump.
31	R. vis.	29	0.5	0.3	0.5	0.3	Medium	Ditto
32	R. vis.	29	0.5	0.3	0.5	0.3	Medium	Ditto
33	R. vis.	29	3.0	2.5	5.0	4.0	Heavy	(S.E.) Heavy snow brush upper end big black log.
34	R. vis.	29	2.5	2.0	4.0	3.0	Heavy	(N.) S. edge snow brush.
36	R. vis.	29	1.5	1.0	1.5	1.0	Light	(S.) S. edge bare area.
37	R. vis.	29	2.5	2.0	7.0	6.0	Light	(SE) S. edge bare area.
38	R. vis.	29	1.0	1.0	2.0	2.0	Light	(None) In opening.
39	R. vis.	29	1.5	1.0	1.5	1.0	Medium	(N.) In snow brush.
42	R. vis.	29	0.3	0.2	0.3	0.2	Medium	(None) In mixed brush. At top of steep bare north area.
43	R. vis.	29	0.3	0.2	0.3	0.2	Medium	Ditto

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
44	R. vis.	29	0.8	0.5	0.8	0.5	Medium	(None) In mixed brush. At. top of steep bare north area.
45	R. vis.	29	0.5	0.3	0.5	0.3	Medium	(All ±) In mixed brush.
46	R. vis.	29	0.8	0.6	0.8	0.6	Light	(None ±) In open Salix.
47	R. vis.	29	3.0	3.0	7.0	6.0	Medium	(E.) In W. edge snow brush.
48	R. vis.	29	0.4	0.2	0.4	0.2	Open	(S.) Bare ground N. side large Cedar stump.
49	R. vis.	30	1.5	1.0	1.5	1.0	Open	(SW.) General vegetation 12". 10' circle.
50	R. vis.	30	1.0	0.8	1.0	0.8	Light	(All ±) General vegetation 12". 10' circle.
51	R. vis.	30	0.5	0.3	0.5	0.3	Medium	(All ±) General vegetation 12". 10' circle.
52	R. vis.	30	1.3	1.0	1.3	1.0	Open	(None) General vegetation 3". 6" apart. 10' circle.
53	R. vis.	30	0.8	0.5	0.8	0.5	Open	(None) General vegetation 3". 6" apart. 10' circle.
54	R. vis.	30	0.4	0.2	0.4	0.2	Open	(None) General vegetation 3". 6" apart. 10' circle.
55	R. vis.	30	1.0	1.0	1.0	1.0	Heavy	(E-W-S) Dense snow brush.
56	R. vis.	30	1.5	1.5	2.5	2.5	Heavy	(S-W-N) Mixed brush. 2' apart.
57	R. vis.	30	1.0	1.0	2.0	1.0	Heavy	(S-W-N) Mixed brush. 2' apart.
58	R. vis.	30	1.0	1.0	1.0	1.0	Heavy	(S-W-N) Mixed brush. 2' apart.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
59	R. vis.	30	0.5	0.5	0.5	0.5	Light	(W.) Very little vegetation 8" space.
60	R. vis.	30	0.2	0.1	0.2	0.1	Light	Ditto
61	R. vis.	30	0.2	0.1	0.2	0.1	Light	Ditto
62	R. vis.	30	0.2	0.1	0.2	0.1	Light	Ditto
63	R. vis.	30	0.2	0.1	0.2	0.4	Light	Ditto
64	R. vis.	30	0.2	0.1	0.2	0.1	Light	Ditto
65	R. vis.	30	3.0	2.0	20.0	15.0	Medium	(S.N.) In Salix and snow brush.
66	R. vis.	30	2.0	2.0	5.0	4.0	Medium	(None ±) In Salix and snow brush.
67	R. vis.	30	3.0	2.5	8.0	6.0	Medium	(NE) In Acer & Prunus. 2' apart.
68	R. vis.	30	3.0	3.0	7.0	6.0	Medium	(W.) In Acer & Huckleberry. 2' apart.
69	R. vis.	30	0.6	0.4	0.6	0.4	Medium	(None) Vegetation 12".
70	R. vis.	30	0.5	0.3	0.5	0.3	Medium	Ditto
71	R. vis.	30	2.0	1.5	2.0	1.5	Open	(None) Vegetation 18". 10' circle.
72	R. vis.	30	0.8	0.5	0.8	0.5	Medium	(N.E.) Under 6' W. P. 10' circle.
73	R. vis.	30	1.0	0.7	1.0	0.7	Medium	(N.E.) Under Salix. 10' circle.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L.S June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
74	R. vis.	30	0.5	0.4	0.5	0.4	Medium	(E.) Under Salix. 10' circle.
75	R. vis.	30	2.5	2.0	2.5	2.0	Open	(None) 12" vegetation 10' circle.
76	R. vis.	30	0.3	0.2	0.3	0.2	Medium	(None) 18" vegetation 10' circle.
77	R. vis.	30	0.8	0.6	0.8	0.6	Medium	(None) 18" vegetation. 10' circle.
78	R. vis.	30	1.2	0.8	1.2	0.8	Medium	(None) 18" vegetation. 10' circle.
79	R. vis.	30	2.0	2.0	4.0	4.0	Light	(None) 24" vegetation. 10' circle.
80	R. vis.	30	1.5	1.2	1.5	1.2	Medium	(E.) 24" vegetation. 10' circle.
81	R. vis.	30	0.8	0.6	0.8	0.6	Heavy	(S.) Under 8' W.P. 10' circle.
83	R. vis.	30	0.5	0.1	1.0	0.1	Light	(None ±) Old bush died almost to root.
84	R. vis.	30	0.5	0.3	0.5	0.3	Medium	(E.) Opening in brush.
86	R. vis.	30	2.0	2.0	5.0	4.0	Light	(None ±) 1' from cut brush #85
87	R. vis.	30	3.0	2.5	5.0	4.0	Medium	(S.) In mixed brush.
88	R. vis.	30	2.5	2.0	4.0	3.0	Heavy	(N-E) In mixed brush.
89	R. vis.	30	4.0	3.0	5.0	3.0	Medium	(None) In Mixed brush.
90	R. vis.	30	0.8	0.6	0.8	0.6	Medium	(None) In mixed brush.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
91	R. vis.	31	2.0	1.5	4.0	3.0	Medium	(None) In mixed brush.
94	R. vis	31	0.3	0.2	0.3	0.2	Heavy	(All ±) In dense Salix 12".
95	R. vis.	31	2.5	2.0	2.5	2.0	Heavy	(W.) In dense snow brush.
96	R. lac.	31	2.5	2.0	10.0	9.0	Medium	(E.) In rather open mixed brush.
97	R. vis.	31	1.5	0.6	1.5	0.6	Heavy	(All ±) In rather open Salix.
98	R. vis.	31	0.8	0.5	0.8	0.5	Open	(None) In open bare area.
99	R. vis.	31	0.5	0.1	0.8	0.1	Open	(None) Very open bare area. Bush broken off 1" above 1922
100	R. vis.	31	1.0	0.8	1.0	0.8	Medium	(S.) In rather open mixed brush.
101	R. vis.	31	0.6	0.4	0.6	0.4	Light	(S.) In rather open low bushes.
102	R. vis.	31	2.5	2.0	4.0	3.0	Heavy	(E.) In dense Salix.
103	R. vis.	31	0.6	0.4	0.6	0.4	Open	(S.) In very open area.
104	R. vis.	31	0.5	0.2	0.5	0.2	Light	(E.) In rather open area. 3' across.
105	R. vis.	31	0.5	0.3	0.5	0.3	Light	(E.) In rather open area. 3' across.
106	R. vis.	31	0.2	0.1	0.2	0.1	Medium	(E.) On E. edge open area, under snow brush. 3' across.
107	R. vis.	31	0.2	0.1	0.2	0.1	Medium	(E) On E. edge open area under snow brush. 3' across

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
108	R. vis.	31	0.2	0.1	0.2	0.3	Medium	(E.) On E. edge open area. under snow brush. 3' across.
109	R. vis.	31	0.2	0.1	0.2	0.1	Medium	(E.) On E. edge open area. under snow brush. 3' across.
110	R. vis.	31	0.6	0.4	0.6	0.4	Open	(E.) In open area. 3' across.
111	R. vis.	31	1.0	0.6	1.0	0.6	Open	(E.) In open area. 3' across.
112	R. vis.	31	1.2	1.0	1.2	1.0	Open	(E.) In open area. 3' across.
113	R. vis.	31	1.2	1.0	1.2	1.0	Medium	(All ±) Opening in brush.
115	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
116	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
117	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
118	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
119	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
120	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
121	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
122	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.
123	R. vis.	31	0.4	0.2	0.4	0.2	Open	(W.) On rather bare area.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
124	R. vis.	31	5.0	4.5	12.0	11.0	Light	(None) In opening in very scattering mixed brush. 3' circle.
125	R. vis.	31	0.8	0.6	0.8	0.6	Medium	(None) In opening in very scattering mixed brush. 3' circle.
128	R. vis.	32	3.0	2.5	8.0	7.0	Heavy	(All ±) Dense snow brush. 12' from W. fence.
129	R. vis.	32	5.5	5.0	20.0	17.0	Heavy	(All ±) Dense snow brush. 12' from W. Fence.
130	R. vis.	32	1.0	1.0	1.0	1.0	Heavy	(All ±) Dense snow brush. 20' from W. fence. 10' E. of 128-129.
131	R. vis.	32	0.6	0.3	1.0	0.3	Heavy	(All ±) Dense snow brush. 20' from fence. 10' E. of 128-129
132	R. vis.	32	0.4	0.2	0.4	0.2	Heavy	(All ±) Dense snow brush. 20' from fence. 10' E. of 128-129
134	R. vis.	32	1.0	1.0	1.0	1.0	Heavy	(All ±) Cut flush. 8' E. of last group.
135	R. vis.	32	1.0	1.0	1.0	1.0	Heavy	(All ±) Cut flush. 8' E. of last group.
138	R. vis.	32	1.0	1.0	1.0	1.0	Light	(None ±) Growing 6" from cut bush.
139 to 150	R. vis.	32	0.1	0.1	0.1	0.1	Open	(S.) Under N. edge of log 50' to W. fence.
151	R. vis.	32	0.2	0.1	0.1	0.1	Open	(S.) On N. edge of stump 4' NE. of clump of seedlings.
152	R. vis.	32	1.5	1.0	1.5	1.0	Heavy	(E.) On W. edge of dense snow brush.
153	R. vis.	32	2.5	1.5	10.0	7.0	Light	(None) In opening.
154	R. vis.	32	3.0	3.0	12.0	10.0	Heavy	(All ±) In dense Salix. NE. slope.

BLOCK 1 (Continued) 36

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
155	R. vis.	32	2.5	2.0	20.0	18.0	Heavy	(S.W.) In NE. side dense snow brush.
156	R. vis.	32	2.0	1.5	2.0	1.5	Heavy	(All) Dense snow brush.
157	R. vis.	32	1.0	0.8	1.0	0.8	Medium	(N.W.) SE. edge snow brush.
158	R. vis.	32	0.5	0.5	1.0	1.0	Medium	(S.) N. edge snow brush.
159	R. vis.	32	0.3	0.2	0.3	0.2	Medium	(S.W.) In edge opening.
160	R. vis.	32	0.6	0.4	0.6	0.4	Heavy	(E.S.W.) In mixed brush.
161	R. vis.	32	0.8	0.5	0.8	0.5	Light	(S.) In opening.
163	R. vis.	32	1.5	1.0	1.5	1.0	Medium	(E.W.) In opening between brush.
164	R. vis.	32	2.0	2.0	5.0	4.0	Light	(E.) N. edge low brush.
165	R. vis.	32	2.0	2.0	4.0	4.0	Open	(None) Opening 8" vegetation.
166	R. vis.	32	1.0	0.5	1.5	1.0	Light	(S.W.) N. edge dense brush. 3' circle.
167	R. vis.	32	0.6	0.4	0.6	0.4	Light	Ditto
168	R. vis.	32	1.5	1.5	3.0	2.0	Medium	(E.S.) In edge dense brush. 3' circle.
169	R. vis.	32	0.2	0.1	0.2	0.1	Medium	(All ±) In edge dense brush. 3' circle.
170	R. vis.	32	0.2	0.1	0.2	0.1	Medium	Ditto

BLOCK 1 (Continued) 37

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
171	R. vis.	32	0.2	0.1	0.2	0.1	Medium	(All ±) In edge dense brush. 3' circle.
174	R. vis.	32	2.5	2.0	15.0	10.0	Medium	(NE) In open snow brush 18".
175	R. vis.	32	0.8	0.6	0.8	0.6	Medium	(S.) In open snow brush. 18".
177	R. vis.	32	0.5	0.5	0.5	0.5	Medium	(All ±) Open brush.
178	R. vis.	32	0.5	0.5	0.5	0.5	Medium	Ditto
179	R. vis.	32	1.0	1.0	1.0	1.0	Light	(None) 12" vegetation.
180	R. vis.	32	0.7	0.5	0.7	0.5	Open	(None) Quite bare.
181	R. vis.	32	1.0	0.5	1.0	0.5	Light	(None) 12" vegetation.
182 to 189	R. vis.	32	0.2	0.2	0.2	0.2	Open	(S.) Bare ground.
190	R. vis.	32	2.0	1.5	4.0	3.0	Light	(None) 18" vegetation.
191	R. vis.	32	1.5	1.0	1.5	1.0	Light	(W.) 12" vegetation. 12' S. to fence corner.
192	R. vis.	32	2.0	1.5	3.0	2.0	Heavy	(All) In dense mixed brush 16' from fence.
193	R. vis.	32	2.5	2.0	15.0	12.0	Medium	(E.) In dense mixed brush 30' from fence.
194	R. vis.	32	3.0	3.0	6.0	6.0	Medium	(All ±) In dense mixed brush. 40' from fence.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
195	R. vis.	32	1.2	1.0	1.2	1.0	Open	(None) 6" vegetation.
196	R. vis.	32	1.3	0.8	1.3	0.8	Medium	(W.) 12" vegetation 6' W. of 197.
197	R. vis.	32	3.5	3.0	15.0	13.0	Light	(None) With single Prunus 10' W. of trail.
198	R. vis.	33	2.0	2.0	2.0	2.0	Light	(N.) Opening in brush.
199	R. vis.	33	3.0	2.5	10.0	8.0	Light	(N.) Opening in brush.
200	R. vis.	33	5.0	4.5	75.0	65.0	Light	(None) Opening in brush.
201	R. vis.	33	2.0	1.5	2.0	1.5	Medium	(N.) S. edge Amelanchier 4' from trail 10' from fence.
202	R. vis.	36	2.5	2.0	10.0	8.0	Medium	(None) In opening in mixed brush 20' from fence.
203	R. vis.	36	2.0	1.5	3.0	2.0	Medium	(None) In opening in mixed brush 20' from fence.
204	R. vis.	36	3.5	3.5	12.0	12.0	Light	(None) In opening in mixed brush 25' from fence.
205	R. vis.	36	3.5	3.0	15.0	12.0	Light	(None) In opening in mixed brush 25' from fence.
206	R. vis.	36	4.5	4.0	20.0	16.0	Light	(None) In opening in mixed brush 25' from fence.
207	R. vis.	36	4.0	4.0	30.0	30.0	Light	(None) In opening in mixed brush 25' from fence.
208	R. vis.	36	4.5	4.0	75.0	65.0	Light	(None) In opening in mixed brush 25' from fence.
209	R. vis.	36	1.5	1.0	7.0	4.0	Light	(None) In opening in mixed brush 25' from fence.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. vis.	37	4.5	4.0	10.0	8.0	Heavy	(All ±) Dense Ceanothus 20' from fence.
2	R. vis.	38	2.5	2.0	16.0	10.0	Light	(None) 30' from style & 12' from fence.
3	R. vis.	38	5.0	4.5	70.0.	20.0	Light	(None) Heavy Ceanothus & Salix of equal height. 20' from fence. 12' from trail.
4	R. vis.	38	4.5	3.8	12.0	9.0	Medium	(E.) W. edge heavy Ceanothus 12' from trail. 20' from fence
5	R. vis.	33	3.5	3.0	20.0	14.0	Open	(None) 12" vegetation. Regular flag.
6	R. vis.	33	2.0	2.0	4.0	3.0	Heavy	(All ±) Dense Salix & Ceanothus.
7	R. vis.	33	0.8	0.6	0.8	0.6	Heavy	Ditto
8	R. vis.	33	2.5	1.5	3.0	1.5	Light	(E.) W. edge dense Ceanothus.
9	R. vis.	33	2.0	2.0	4.5	2.5	Open	(None) In quite bare area.
10	R. vis.	33	2.0	2.0	6.0	5.0	Light	(None ±) With small Salix.
11 to 16	R. vis.	33	0.1	0.1	0.1	0.1	Light	(S.) On practically bare ground.
17	R. vis.	33	1.5	0.8	2.0	1.2	Medium	(All ±) In opening dense brush.
18	R. vis.	33	4.0	3.5	18.0	12.0	Heavy	(All ±) Bush cut flush, but two branches left.
19	R. vis.	33	0.8	0.5	0.8	0.5	Light	(S.) Scattered low vegetation.
20	R. vis.	33	1.0	0.3	1.0	0.3	Medium	(S.W.) broken off 1922 3" high.

BLOCK 1 (Continued) 40

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
22	R. vis.	33	2.5	2.0	3.0	2.0	Light	(S.) Under edge of W. fir 6'. 3' circle.
23	R. vis.	33	2.0	2.0	2.5	2.5	Light	Ditto
24	R. vis.	33	2.8	2.0	7.5	6.5	Light	Ditto
25	R. vis.	33	4.0	3.5	10.0	7.0	Light	(W.) At E. edge of W. fir 6' 3' circle.
26	R. vis.	33	2.5	2.0	4.0	3.0	Heavy	(N.W.) Under SE. edge of W. fir 6'. 3' circle.
27	R. vis.	33	1.5	1.5	1.5	1.5	Medium	(None) 3' E. of W. fir 6'. 3' circle.
28	R. vis.	33	1.0	0.4	1.0	0.4	Medium	(None) 10' NW. of last group opening between bushes. 5' circle.
29	R. vis.	33	1.0	0.8	1.5	1.0	Medium	Ditto
30	R. vis.	33	0.8	0.2	0.8	0.2	Medium	(None) 10' NW. of last group. Opening between bushes under 5' W. fir. 5' circle.
31	R. vis.	33	1.0	1.0	1.8	1.8	Medium	Ditto
32	R. vis.	33	3.0	2.5	5.0	4.0	Medium	Ditto
34	R. vis.	33	1.5	0.8	1.5	0.8	Heavy	(All) Under heavy Ceanothus. 2' circle.
35	R. vis.	33	0.8	0.4	0.8	0.4	Heavy	Ditto
36	R. vis.	33	1.2	1.0	1.4	1.2	Heavy	Ditto
37	R. vis.	33	1.2	0.8	2.0	1.0	Heavy	Ditto

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
38	R. vis.	33	3.0	2.0	3.0	2.0	Heavy	(All) Under heavy Ceanothus. 2' circle.
39	R. vis.	33	3.0	2.0	3.0	2.0	Light	(S.) Edge of opening in brush.
40	R. vis.	33	1.0	0.6	1.0	0.6	Light	(None) Edge of opening in brush.
41	R. vis.	33	1.0	0.5	1.0	0.5	Heavy	(All) In dense squaw mat.
42	R. vis.	33	1.0	0.8	1.0	0.8	Light	(N.) In N. edge bare area.
43	R. vis.	33	1.0	0.8	1.0	0.8	Light	(N.) In N. edge bare area.
44	R. vis.	33	1.0	0.8	2.0	0.8	Heavy	(S.) Large bush eradicated except one small twig.
45	R. vis.	33	2.2	1.5	8.0	4.0	Light	(None) With small scattering Salix.
46	R. vis.	33	3.5	3.0	14.0	12.0	Medium	(E.) Under W. edge Ceanothus
47	R. vis.	33	0.8	0.4	0.8	0.4	Heavy	(E-W-S)Under dense Ceanothus
48 to 51	R. vis.	33	0.1	0.1	0.1	0.1	Open	(W.) Bare ground under edge of black log.
53	R. vis.	34	1.5	1.0	1.5	1.0	Heavy	(All) Dense Salix & Ceanothus.
54	R. vis.	34	3.5	3.0	35.0	28.0	Heavy	(All) Heavy Ceanothus.
55	R. vis.	34	1.5	1.5	2.0	1.5	Light	(E.) W. edge Ceanothus
57	R. vis.	34	1.0	0.5	2.0	1.0	Medium	(None) In open with herbs.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
58	R. vis.	34	1.0	1.0	2.0	1.5	Medium	(W.) E. edge of brush. 3' circle.
59	R. vis.	34	1.5	1.0	1.5	1.0	Medium	(W.) E. edge of brush. 3' circle.
60	R. vis.	34	3.0	2.5	4.0	3.0	Medium	(W.) E. edge of brush. 3' circle.
61	R. vis.	34	0.5	0.5	1.0	0.5	Heavy	(W.) E. edge of brush. 3' circle.
62	R. vis.	34	1.0	1.0	1.0	1.0	Medium	(All ±) In brush. 3' circle 3' SE. of group 22 to 27.
63	R. vis.	34	0.6	0.5	0.6	0.5	Medium	(All ±) In brush. 3' circle 3' SE. of group 22 to 27.
64	R. vis.	34	0.1	0.1	0.1	0.1	Heavy	(All ±) In brush. 3' circle 3' SE. of group 22 to 27.
65	R. vis.	34	0.1	0.1	0.1	0.1	Heavy	(All ±) In brush. 3' circle 3' SE. of group 22 to 27.
66	R. vis.	34	1.5	1.0	1.5	1.0	Light	(All ±) SE. edge brush. 3' SE. of group 22 to 27. 3' circle.
67	R. vis.	34	0.4	0.2	0.4	0.2	Light	(All ±) SE. edge brush. 3' circle. 3' SE. of group 22 to 27.
68	R. vis.	34	2.0	1.5	2.0	1.5	Light	(All ±) SE. edge brush. 3' circle. 3' SE. of group 22 to 27.
69	R. vis.	34	2.0	1.0	2.0	1.0	Light	(All ±) SE. edge brush. 3' circle. 3' SE. of group 22 to 27.
70	R. vis.	34	1.5	1.0	2.5	2.0	Light	(All ±) SE. edge brush. 3' circle. 3' SE. of group 22 to 27.
71	R. vis.	34	1.0	0.5	1.0	0.5	Light	(None) In opening between brush.
72	R. vis.	34	3.0	2.5	3.0	2.5	Heavy	(All ±) In dense Ceanothus.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
73	R. vis.	34	1.5	1.0	2.5	2.0	Medium	(W.) Under heavy Ceanothus.
74	R. vis.	34	1.5	1.5	2.0	2.0	Medium	Ditto
75	R. vis.	34	1.5	1.0	1.5	1.0	Light	(None) In open with herbs.
77	R. vis.	34	0.8	0.8	1.5	1.0	Open	(None) Very little vegetation
78	R. vis.	34	0.8	0.3	0.8	0.3	Heavy	(All ±) In dense mixed brush.
79	R. vis.	34	2.0	1.5	2.5	2.0	Heavy	Ditto
80	R. vis.	34	4.5	4.0	8.0	7.0	Heavy	(All ±) I dense Ceanothus, & Acer 25' from fence on E. edge of brush.
81	R. vis.	34	1.2	1.0	1.2	1.0	Light	(S.) Under small Ceanothus 12' from fence.
82	R. vis.	35	0.6	0.2	1.5	0.2	Light	(None) In open.
83	R. vis.	35	1.5	1.5	2.0	2.0	Medium	(S.) Under open brush. 3' circle 25' N. of fence at N. edge of brush.
84	R. vis.	35	1.5	1.2	1.5	1.2	Medium	Ditto
85	R. vis.	35	2.0	2.0	4.0	3.0	Medium	Ditto
86	R. vis.	35	0.6	0.3	0.6	0.3	Heavy	Ditto
87	R. vis.	35	1.5	0.8	1.5	0.8	Light	(N.) In edge opening.
88	R. vis.	35	2.5	2.0	2.5	2.0	Light	(W.) On E. edge of 5 W.P.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L.S June 1923	Feet L.S. 1922	Degree Of Concealment	Special Notes
89	R. vis.	35	0.6	0.4	0.6	0.4	Heavy	(All) In dense Ceanothus.
90	R. vis.	35	3.0	3.0	9.0	8.0	Light	(S.) In N. edge mixed brush.
91	R. vis.	35	0.6	0.5	0.6	0.5	Heavy	(All) Under dense mixed brush.
92	R. vis.	35	2.0	1.3	7.0	4.0	Heavy	(All)Under dense mixed brush
93	R. vis.	35	2.0	1.5	2.0	1.5	Light	(N.) On S. edge mixed brush.
94	R. vis.	35	1.5	0.8	1.5	0.8	Heavy	(All) In dense brush.
95	R. vis.	35	1.0	1.0	1.0	1.0	Light	(None) In small brush. 4' circle. 35' N. of fence where black post leans on it
96	R. vis.	35	0.8	0.8	1.4	1.4	Medium	(None)In small brush. 2"apart 4' circle. 35'N. of fence where black post leans against it.
98	R. vis.	35	0.2	0.1	0.5	0.1	Medium	(None)2"from cut bush. 4' circle. 35'N. of fence where black post leans against it.
99	R. vis.	35	0.5	0.4	0.5	0.4	Medium	(None)3"from cut bush. 4' circle. 35'N. of fence where black post leans against it.
100	R. vis.	35	0.6	0.6	0.6	0.6	Medium	(None)6"from cut bush. 4' circle. 35'N. of fence where black post leans against it.
102	R. vis.	35	0.5	0.2	0.5	0.2	Medium	(None)Broken off2"high last year. 4'circle. 35'N. of fence where black post leans on it
103	R. vis.	35	0.5	0.2	1.0	0.2	Medium	(None)Broken off2"high 1922. 4'circle. 35'N. of fence where black post leans against it.
104	R. vis.	35	1.0	1.0	1.0	1.0	Medium	(None)12"from cut bush. 4' circle. 35'N. of fence where black post leans against it.
105	R. vis.	35	0.2	0.1	0.2	0.1	Medium	(None)12"from cut bush. 4' circle. 35'N. of fence where black post leans against it.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
106	R. vis.	35	0.8	0.1	0.8	0.1	Medium	(None) 12" from cut bush. 4' circle. 35'N. of fence where black post leans against it.
107	R. vis.	35	2.5	2.0	2.5	2.0	Medium	ditto
108	R. vis.	35	0.6	0.1	0.6	0.1	Medium	(None) 16" from cut bush. 4' circle. 35'N. of fence where black post leans against it.
109	R. vis.	35	0.6	0.2	0.6	0.2	Medium	ditto
110	R. vis.	35	0.5	0.5	0.5	0.5	Medium	(None) 18" from cut cush. 4' circle. 35'N. of fence where black post leans against it.
112	R. vis.	35	1.5	1.0	1.5	1.0	Medium	(None) 12" from cut bush. 4' circle. 35'N. of fence where black post leans against it.
113	R. vis.	35	0.8	0.8	0.8	0.8	Medium	(None) 2' from cut bush. 4' circle. 35'N. of fence where black post leans against it.
114	R. vis.	35	0.5	0.5	0.5	0.5	Medium	(None) 3' from cut bush. 4' circle. 35'N. of fence where black post leans against it.
115	R. vis.	35	1.0	0.5	1.0	0.5	Medium	(None) 2' from cut bush. 4' circle. 35'N. of fence where black post leans against it.
116	R. vis.	35	0.4	0.3	0.4	0.3	Medium	(None) 2' from cut bush. 4' circle. 35'N. of fence where black post leans against it.
117	R. vis.	35	0.6	0.1	0.6	0.1	Medium	(None) 2' from cut bush. 4' circle. 35'N. of fence where black post leans against it.
118	R. vis.	35	1.5	1.0	1.5	1.0	Heavy	(None) 6' NW. of group.
119	R. vis.	35	1.5	1.0	1.5	1.0	Heavy	(None) 6' NW. of group.
120	R. vis.	35	0.6	0.5	0.6	0.5	Heavy	ditto
121	R. vis.	35	1.0	0.4	1.0	0.4	Heavy	ditto

BLOCK 1 (Continued) 46

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
122	R. vis.	35	1.5	1.0	1.5	1.0	Heavy	(None) 8' NW. of group.
123	R. vis.	35	2.5	2.5	6.0	4.0	Heavy	(None) 10' NW. of group.
124	R. vis.	35	1.0	0.4	1.0	0.4	Heavy	(All) In dense brush 10' NW. of group.
125	R. vis.	35	1.0	0.5	1.0	0.5	Heavy	Ditto
126	R. vis.	35	0.8	0.6	0.8	0.6	Heavy	Ditto
127	R. vis.	35	2.5	2.0	3.0	2.0	Heavy	(S.) In dense brush at N. edge 12' W. of group.
128	R. vis.	35	2.0	1.0	6.0	1.5	Heavy	(All) In dense brush all but one branch cut 1922.
129	R. vis.	35	1.5	0.5	1.5	0.5	Heavy	(All) In dense brush.
130	R. vis.	35	2.5	2.0	3.5	2.0	Heavy	Ditto
131	R. vis.	35	4.5	4.0	20.0	15.0	Medium	(N.) In S. edge dense Ceanothus 40' E. of 20' black snag
132	R. vis.	35	5.0	4.0	15.0	12.0	Heavy	(S.) N. edge dense Ceanothus & Salix. 20' E. of 20' black snag.
133	R. vis.	35	1.0	1.0	1.0	1.0	Heavy	(All) Dense Ceanothus & Salix 15' E. of 20' black snag.
134	R. vis.	35	1.5	1.0	1.5	1.0	Open	(None) Very little vegetation.
135	R. vis.	35	3.0	2.0	6.0	4.0	Heavy	(All ±) Dense Salix 15' from W. fence.
136	R. vis.	35	2.5	2.5	7.0	5.0	Heavy	(All ±) Dense Ceanothus 7' from W. fence 7 posts from SW. corner.

BLOCK - 1 (Continued) 47

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
139	R. vis.	36	0.8	0.6	0.8	0.6	Open	(E.) In open bare spot 20' from fence. 1' circle.
140	R. vis.	36	1.0	0.8	1.0	0.8	Open	(E.) In open bare spot 20' from fence. 1' circle.
141	R. vis.	36	0.6	0.4	0.6	0.4	Open	(E.) In open bare spot 20' from fence. 1' circle.
142	R. vis.	36	2.0	2.0	4.0	3.0	Open	(E.) In open bare spot 20' from fence. 1' circle.
143	R. vis.	36	0.8	0.4	0.8	0.4	Open	Ditto
144	R. vis.	36	1.0	0.8	1.0	0.8	Open	Ditto
145	R. vis.	36	0.5	0.3	0.5	0.3	Heavy	(All ±) Under Ceanothus.
146	R. vis.	36	0.5	0.3	0.5	0.3	Heavy	Ditto
147	R. vis.	36	0.7	0.4	0.7	0.4	Heavy	Ditto
148	R. vis.	36	0.5	0.4	0.5	0.4	Heavy	Ditto
149	R. vis.	36	1.5	1.0	1.5	1.0	Heavy	Ditto
151	R. vis.	37	3.0	3.0	8.0	8.0	Medium	(S.) Under Salix 20'N. of fence in opening on knoll. 4' circle.
152	R. vis.	37	2.0	1.5	5.0	3.0	Open	(None) In bare spot. 4' circle.
153	R. vis.	37	3.5	2.5	5.0	3.5	Medium	(None) In W. edge of brush 4' circle.
154	R. vis.	37	2.0	1.0	6.0	3.0	Medium	(E.) In E. edge of Ceanothus.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
155	R. vis.	37	3.0	3.0	5.0	4.0	Heavy	(All) In dense Ceanothus.
156	R. vis.	37	3.0	2.0	5.0	3.0	Medium	(All) In S. edge Ceanothus. near lower end long log.
157	R. vis.	37	1.0	1.0	1.0	1.0	Heavy	(All) In dense Ceanothus.
158	R. vis.	37	4.0	4.0	8.0	7.0	Heavy	(All) In dense Ceanothus.
160	R. vis.	37	1.5	1.0	1.5	1.0	Heavy	(All) Heavy Ceanothus.
161	R. vis.	37	3.5	3.0	10.0	8.0	Open	(E.) In bare opening. 6' apart. 30' S. fence. 40' W. fence.
162	R. vis.	37	2.0	2.0	10.0	8.0	Open	(E.) In bare opening 6' apart. 30' W. fence. 40' W. fence.
163	R. vis.	37	2.5	2.0	8.0	6.0	Open	ditto
164	R. vis.	38	1.0	1.0	1.5	1.5	Light	(SW.) In open Ceanothus.
166	R. vis.	38	0.6	0.4	0.6	0.4	Heavy	(All) In dense vegetation.
167	R. vis.	38	4.5	4.0	12.0	10.0	Open	(None) Openingbetween bushes.
168	R. vis.	38	4.0	3.5	12.0	10.0	Medium	(E.) Under W. side Ceanothus.
169	R. vis.	38	1.0	0.8	1.0	0.8	Medium	(SE.) Under Ceanothus (One branch of large bush cut flush).
172	R. vis.	38	1.5	1.0	1.5	1.0	Heavy	(All±) 8" from cut bush.
173	R. vis.	38	3.5	3.0	6.0	4.0	Heavy	(All ±) Dense Ceanothus.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
174	R. vis.	38	1.0	1.0	1.0	1.0	Heavy	(All ±) Dense Ceanothus cut flush.
176	R. vis.	38	2.0	1.5	2.0	1.5	Heavy	(All ±) Dense Ceanothus.
177	R. vis.	38	4.5	4.0	22.0	20.0	Heavy	(All ±) Dense Ceanothus. 16' from S. fence.
178	R. vis.	38	1.5	1.0	1.5	1.0	Open	(None)N. edge of trail.
179	R. vis.	38	1.5	1.0	1.5	1.0	Medium	(None) 2' N. of trail.
181	R. vis.	39	2.0	2.0	5.0	4.0	Medium	(None) 1' from post in S. fence.
182	R. vis.	39	3.0	2.5	12.0	10.0	Heavy	(All) 28' from fence. 2' apart dense Ceanothus.
183	R. vis.	39	1.5	1.0	3.0	2.0	Heavy	(All) 25' from fence. 2' apart. Dense Ceanothus.
184	R. vis.	39	1.5	1.0	1.5	1.0	Heavy	(All) 25' from fence. 1' apart.
185	R. vis.	39	2.5	2.5	10.0	8.0	Heavy	Ditto
186	R. vis.	39	2.0	2.0	4.0	3.6	Open	(None) 16' S. of 12' black snag 3' E. of blackcaps.
187	R. vis.	40	3.0	2.5	10.0	8.0	Open	(None) 16' N. of fence 12' W. of pile red dirt.
188	R. vis.	41	2.5	2.0	15.0	13.0	Open	(None) 16' N. of fence.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
2	R. vis.	2	4.0	3.5	75.0	65.00	Open	General vegetation 12". June 14 evening.
3	R. vis.	2	0.7	0.7	1.5	1.5	Light	General vegetation equal. June 14 evening.
4	R. vis.	3	2.5	2.0	35.0	30.0	Open	10' E. of road. June 14 evening.
5	R. vis.	3	2.5	2.0	20.0	15.0	Open	Ditto
6	R. vis.	3	5.0	4.5	25.0	20.0	Heavy	SE. edge maple. June 14 evening.
7	R. vis.	4	3.5	3.0	7.0	5.0	Open	In 12" vegetation.
8	R. vis.	4	2.0	1.5	5.0	2.5	Open	Ditto
9	R. vis.	4	1.0	0.5	1.0	0.5	Open	In 4" Vegetation.
10	R. lac.	5	2.5	1.8	10.0	7.0	Open	In 12" vegetation.
11	R. vis.	6	2.0	2.0	8.0	6.0	Light	In edge of maple clump.
12	R. vis.	6	3.0	2.5	22.0	20.0	Open	In 6" vegetation
13	R. vis.	7	2.5	2.5	7.0	4.0	Open	In 12" vegetation.
15	R. vis.	7	1.5	1.0	4.0	2.0	Open	In 12" vegetation 6'apart. 10' NW. of tagged 14.
16	R. vis.	7	1.5	0.8	4.0	2.0	Open	Ditto
19	R. vis.	8	5.0	4.5	40.0	35.0	Light	In scattering Salix.

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
20	R. vis.	8	4.0	4.0	25.0	20.0	Open	In 12" vegetation.
21	R. vis.	8	1.5	0.8	1.5	0.8	Medium	In thick 18" vegetation 2' apart. 8' NE. of #14.
22	R. vis.	8	1.0	0.4	2.0	0.4	Light	In open very small Salix large bush been broken off. 2' apart. 8' NE. of #14.
23	R. lac.	9	0.7	0.5	3.0	2.5	Open	In open equal vegetation 3' NE. of barbed fence 10' S. of spring.
24	R. lac.	10	5.0	4.5	45.0	35.0	Open	10' below barbed fence at edge of bog between logs.
25	R. lac.	10	2.0	2.0	25.0	22.0	Open	15' S. of trail in 12" vegetation.
27	R. vis.	11	2.0	1.5	5.0	3.0	Open	In 6" vegetation.
28	R. lac.	12	2.5	2.0	2.5	2.0	Heavy	Under dense Maples 8' N. of barb fence 12' W. to nearest cat-tails.
29	R. vis.	12	2.0	2.0	7.0	5.0	Open	4" vegetation.
31	R. lac.	13	1.5	1.0	15.0	10.0	Open	At NE. edge of stump. Very little vegetation.
32	R. lac.	13	2.0	1.8	10.0	8.0	Medium	At NE. edge of Maple clump 6' N. of fence.
34	R. vis.	19	3.0	3.0	15.0	12.0	Open	In 6" vegetation and scattered. Small Salix 10' S. of pile dirt. 4' Circle.
35	R. vis.	19	2.5	2.0	9.0	7.0	Light	In 6" vegetation and scattered small Salix. 4' circle. 10' S. of pile dirt.
36	R. vis.	19	3.0	2.8	5.0	4.0	Open	In 6" vegetation & scattered small Salix. 4' circle. 10' S. of pile dirt. W. edge Maple.

TABLE 45

ELK RIVER - BLOCK 2 - 1923 PLOT 1 - 3 ACRES

No.	Species of Ribes	Strip No.	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. vis.	1	4.5	4.0	40.0	30.0	Open	50' N. & 25' W. of NW. Cor. Plot 1 (Steep N-NW. Slope)
2	R. vis.	1	5.0	4.5	350.0	325.0	Open	40' N. & 10' W. of NW. Cor. Plot 1 (Steep N-NW. Slope). W. edge overturned stump.
3	R. vis.	2	5.0	5.0	60.0	55.0	Open	75' N. & 10' W. of NW. Cor. Plot 1 6' W. of Big N.S. Log Bridge level ground.
4	R. vis.	3	4.0	3.5	80.0	70.0	Light	20' E. of N.S. log of No. 3. Gentle N.E. slope.
5	R. vis.	6	3.0	3.0	15.0	15.0	Light	About 75'-100'S.of Plot 2. About 200'N-NE.ofNW.Cor.Plot 1.16'circle 10'N.to draw.Gentle N.S.
6	R. vis.	6	3.0	3.0	10.0	10.0	Light	About 200'N-NE.of NW.Cor.Plot 1. 15'-30'NE. of big upturned snag root.Gentle N. Slope.
7	R. vis.	6	4.0	4.0	30.0	30.0	Open	Snag root. Gentle N. slope. About 200'N-NE.of NW.Cor.Plot/ 1.15'-30'NE.of big upturned/
8	R. vis.	6	2.0	1.2	6.0	4.0	Medium	Ditto
9	R. vis.	6	3.0	3.0	9.0	8.0	Light	15' SW. of 5-6-7. About 75'-100' W. of Plot 2.
10	R. vis.	6	4.5	4.0	20.0	18.0	Medium	On NE. face of upturned snag root clump. About 75'-100' S. of Plot 2.
11	R. vis.	6	3.0	3.0	12.0	12.0	Light	Ditto
12	R. vis.	8	1.5	1.0	3.0	2.0	Light	NE. slope. 6' SE. of 20" dead WF. About 50' SW. of Plot 2. 18" apart.
13	R. vis.	8	1.0	0.6	1.0	0.6	Light	Ditto

8-E. & W. 33' strips run from N. edge plot 1 nearly to Plot 2. 4E. & W. strips near S. end checked, and no Ribes, another 8-1/3 percent. No Ribes seen in Plots.
The plots were very poorly chosen, both being situated on as level, and as open, ground as was to be had. No steep slopes, and no heavy brush, are within the plots. Approximately 25 percent of the block was covered by this check.

ELK RIVER - BLOCK 3 - PLOT 1 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac	5.5	5.0	25.0	22.0	Open	In mature white pine.
2	R. lac.	3.0	2.5	15.0	12.0	Light	In mature white pine.

Scattered lacustre all thru W. P. W. F. woods.
20' E. of spur 2 of logging R. R.
SW. slope. 16 chains S. of Butt's Creek.

ELK RIVER - BLOCK 3 - 1923 PLOT 2 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	5.0	5.0	15.0	14.0	Open	Logged Area 1922-23
2	R. lac.	6.0	5.5	20.0	18.0	Open	
3	R. lac.	4.5	4.0	50.0	40.0	Open	8 chains down R.R. & 2 chains W. of it.
4	R. lac.	3.0	3.0	12.0	12.0	Open	

E. slope. Logged 1922-23. Lower slope type. W.P.W.F. - Cedar.

ELK RIVER - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. pet.	1.5	1.0	2.5	2.0	Heavy	
2	R. pet.	2.0	1.5	4.0	3.0	Heavy	

ELK RIVER - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE (Continued) 1

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
3	R. pet.	2.5	2.0	3.5	3.0	Heavy	
4	R. pet.	3.5	3.0	3.5	3.0	Heavy	
5	R. pet.	0.5	0.2	0.5	0.2	Heavy	Large brush broken off.
6	R. pet.	1.0	1.0	1.5	1.0	Heavy	
7	R. pet.	1.0	0.3	2.0	0.3	Heavy	Broken off 1922.
8	R. pet.	1.5	1.0	1.5	1.0	Heavy	
9	R. pet.	3.0	3.0	12.0	10.0	Heavy	
10	R. pet.	3.0	2.8	10.0	9.0	Heavy	
11	R. pet.	3.0	2.5	5.0	3.0	Light	
12	R. pet.	3.5	3.0	6.0	5.0	Medium	
13	R. pet.	2.0	1.0	4.0	2.0	Heavy	
14	R. pet.	4.5	4.0	15.0	13.0	Light	
15	R. pet.	2.5	2.5	3.0	3.0	Light	
16	R. pet.	2.0	1.0	3.0	3.0	Heavy	
17	R. pet.	1.0	0.5	1.0	0.5	Heavy	Broken 5" 1922.
19	R. pet.	3.0	2.5	8.0	7.0	Heavy	
20	R. pet.	0.8	0.5	0.8	0.5	Heavy	

South bank of creek or 150 sq. ft. Alluvial bottom. Mouth Butt's Creek.

ELK RIVER - BLOCK 3 - 1923 PLOT 3 - 1/10 ACRE (Continued) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. pet.	5.0	5.0	150.0	140.0	Open	On bank Elk Creek 50' up bank Elk Creek from mouth Butt's Creek.

No other vegetation but grass.

ELK RIVER - BLOCK 3 - PLOT 4 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	2.0	2.0	10.0	8.0	Open	
2	R. lac.	3.0	2.5	18.0	16.0	Open	
3	R. lac.	3.5	3.0	15.0	12.0	Open	

Lower slope logged 1922-23. North side Butt's creek 200' from Butt's Creek, 300' from Elk Creek.

ELK RIVER - BLOCK 3 - 1923 PLOT 5 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1922	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.5	1.0	12.0	9.0	Open	
2	R. lac.	1.5	1.0	8.0	4.0	Light	
3	R. lac.	3.5	3.0	3.0	25.0	Light	
4	R. lac.	1.8	1.5	5.0	4.0	Light	
5	R. lac.	1.8	1.5	3.0	2.5	Open	

100' SE. Plot 4. 50' W. of Spur 2 logging R.R. Well cleaned and heavily skidded over. Some Ribes possibly dragged out.

ELK RIVER - BLOCK 3 - PLOT 7 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	3.0	9.0	7.0	Heavy	
2	R. lac.	1.5	1.0	1.5	1.0	Heavy	
3	R. lac.	3.0	3.0	6.0	4.0	Heavy	
4	R. lac.	1.3	0.5	0.3	0.5	Heavy	2' outside plot.
5	R. lac.	2.5	2.0	3.5	3.0	Medium	2' inside plot.
6	R. lac.	0.6	0.4	1.0	0.4	Heavy	Large brush broken 5" high.
7	R. lac.	1.5	1.0	1.5	1.0	Open	18" inside open.
8	R. lac.	2.0	1.5	3.0	2.0	Heavy	
9	R. lac.	1.0	0.5	1.5	0.6	Medium	
10	R. lac.	1.0	0.3	5.0	0.3	Heavy	Broken off and resprouted.
11	R. lac.	2.0	1.5	5.0	4.0	Open	No other vegetation.
12	R. lac.	0.8	0.7	1.5	0.7	Light	
13	R. lac.	1.5	1.0	1.5	1.0	Heavy	
14	R. lac.	1.5	0.8	1.5	0.8	Heavy	
15	R. lac.	0.8	0.5	1.0	0.7	Heavy	

ELK RIVER - BLOCK 3 - 1923 PLOT 7 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
16	R. lac.	1.5	0.8	1.5	0.8	Heavy	
17	R. lac.	0.7	0.4	0.7	0.4	Heavy	
18	R. lac.	0.6	0.5	2.0	0.5	Light	
19	R. lac.	1.0	0.8	0.8	1.0	Light	
20	R. lac.	1.0	0.2	1.0	0.2	Heavy	Old brush broken off.
21	R. lac.	1.2	0.6	1.2	0.6	Heavy	
22	R. lac.	4.5	4.5	5.5	5.5	Medium	

ELK RIVER - BLOCK 3 - 1923 PLOT 8 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	3.0	2.0	10.0	8.0	Medium	

All littered with brush piles 1/2 vegetation buried or destroyed.

ELK RIVER - BLOCK 3 - 1923 PLOT A - 1/20 ACRE

No.	Specie of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	3.0	6.0	5.0	Open	On edge old rotten stump.

ELK RIVER - BLOCK 3 - 1923 PLOT A - 1/20 ACRE (Continued 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
2	R. lac.	9.0	8.5	20.0	16.0	Light	In edge Crataegus thicket
3	R. lac.	6.5	6.0	15.0	12.0	Light	Ditto
4	R. pet.	8.5	8.0	22.0	20.0	Open	Between two big logs.
5	R. pet.	1.0	0.5	3.0	0.5	Open	Broken off 5" above 1922.

15 of 22 eradicated bushes in edge water growing. Alluvial land 2 chains E. of Elk Creek. 1/4 x 2 chains - 1/20 acre. Approximately 2 chains W. of plot B.

ELK RIVER - BLOCK #3 - 1923 PLOT B - 1/20 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	2.0	3.0	2.0	Medium	
3	R. lac.	4.0	4.0	15.0	15.0	Light	
4	R. lac.	2.5	2.0	2.5	2.0	Light	
7	R. lac.	2.0	2.0	2.0	2.0	Light	
8	R. lac.	4.0	4.0	6.0	5.0	Light	
9	R. lac.	4.0	4.0	20.0	19.0	Light	

ELK RIVER - BLOCK 3 - PLOT B - 1/20 ACRE (Continued) 1

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
10	R. lac.	6.0	6.0	25.0	25.0	Light	
11	R. lac.	4.0	4.0	6.0	5.0	Light	
12	R. lac.	3.0	2.0	20.0	15.0	Light	
13	R. lac.	2.0	2.0	10.0	6.0	Light	
14	R. lac.	6.0	5.5	20.0	18.0	Light	
15	R. lac.	4.0	4.0	15.0	15.0	Light	
16	R. lac.	5.0	4.5	25.0	22.0	Light	
17	R. lac.	8.0	7.0	60.0	55.0	Light	
18	R. lac.	3.0	2.0	10.0	8.0	Light	
19	R. lac.	8.0	8.0	40.0	38.0	Light	
20	R. lac.	5.0	5.0	15.0	15.0	Light	
21	R. pet.	4.0	3.5	6.0	5.0	Heavy	
22	R. pet.	6.0	5.5	95.0	90.0	Light	
23	R. pet.	5.0	5.0	65.0	60.0	Heavy	
24	R. pet.	5.5	4.5	50.0	45.0	Light	

ELK RIVER - BLOCK 3 - PLOT B - 1/20 ACRE (Continued) 2

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
25	R. pet.	4.5	4.5	60.0	55.0	Light	
26	R. pet.	7.0	6.5	38.0	35.0	Light	
27	R. pet.	3.5	3.5	25.0	25.0	Light	
28	R. lac.	5.0	4.0	90.0	80.0	Open	Edge of timber.

Picked out account of great abundance of Ribes in small area. ¼ chain x 2 chains. Approximately N. & S. In edge of alluvium outside of timber. 5 chains SW. of NE. Cor. 1922 Plot 10.

ELK RIVER - BLOCK 3 - 1923 PLOT C - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	3.0	10.0	8.0	Light	
2	R. lac.	3.0	2.5	15.0	14.0	Light	

W. slope approximately 2 chains W. of Plot 25. Steep slope. Open mature W. P. - W. F. with Rosa - Rubus - Mt. Ash - Huckleberry, and others.

ELK RIVER - BLOCK 3 - 1923 PLOT D - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.3	1.0	1.8	1.3	Medium	

Flat. 2 chains SW. Plot C along Elk Creek. 1 chain square, from Creek to foot of slope. No signs of pulled bushes here.

ELK RIVER - BLOCK 3 - 1923 PLOT E - 1/20 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.5	3.0	7.0	6.0	Open	

On E. bank Elk Creek where Creek goes West. 1/8 x 4 chains. At water's edge almost entirely free from vegetation.

ELK RIVER - BLOCK 3 - 1923 PLOT F - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	2.0	2.0	4.0	3.5	Light	
2	R. lac.	1.0	0.5	1.0	0.5	Light	
3	R. lac.	1.5	1.0	2.0	1.5	Light	
4	R. lac.	3.5	3.0	20.0	18.0	Light	
5	R. lac.	2.0	1.5	3.0	2.5	Light	
6	R. lac.	2.5	2.0	10.0	9.0	Light	
7	R. lac.	0.6	0.3	0.6	0.3	Light	
8	R. lac.	3.0	3.0	8.0	7.0	Light	
9	R. lac.	2.0	2.0	3.0	3.0	Light	

ELK RIVER - BLOCK 3 - PLOT F - 1/10 ACRE (Continued) 1

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
10	R. lac.	3.5	3.5	20.0	20.0	Light	
11	R. lac.	2.5	2.0	12.0	10.0	Light	
12	R. lac.	3.5	3.0	8.0	7.0	Light	
13	R. lac.	2.5	2.5	3.5	3.5	Light	
14	R. lac.	2.0	1.5	5.0	4.0	Light	
15	R. lac.	3.0	3.0	8.0	8.0	Light	
16	R. lac.	1.0	0.6	1.0	0.6	Light	

Approximately 8 chains W. of NW. corner SE. Sec. 2.
All these Ribes in one 16' square or 1/160 acre.
2 plots 1/10 each near this with G. & H. No. Ribes at all.
Also on upper slope in heavy timber. Heavy timber W. P. W. F.

ELK RIVER - BLOCK 3 - 1923 PLOT K - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	3.0	12.0	9.0	Open	Cut off 1922 by crew but missed part.
2	R. lac.	1.5	1.5	1.5	1.0	Open	
3	R. lac.	2.0	2.0	6.0	5.0	Open	
4	R. lac.	1.5	1.5	5.0	4.0	Open	

ELK RIVER - BLOCK 3 - 1923 PLOT K - 1/2 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
5	R. lac.	2.5	2.5	12.0	12.0	Light	
6	R. lac.	1.5	1.5	8.0	8.0	Light	
7	R. lac.	2.0	1.5	6.0	5.0	Open	
8	R. lac.	2.0	1.0	10.0	5.0	Open	
9	R. lac.	2.0	1.5	25.0	17.0	Open	
10	R. lac.	2.5	2.0	12.0	9.0	Open	
11	R. lac.	1.5	1.0	8.0	5.0	Open	
12	R. vis.	3.0	2.0	7.0	4.0	Heavy	
13	R. lac.	2.0	1.5	4.0	3.0	Heavy	
14	R. vis.	0.6	0.3	0.6	0.3	Heavy	
15	R. lac.	1.0	0.6	3.0	1.5	Open	
16	R. lac.	1.0	0.8	3.0	1.5	Open	
17	R. lac.	1.5	1.0	20.0	9.0	Open	
18	R. vis.	2.0	1.0	5.0	3.0	Open	
19	R. lac.	1.0	0.7	15.0	6.0	Open	

5 chains S. of NE. Corner. 7 Year burn.

ELK RIVER - BLOCK 3 - 1923 PLOT Z - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.5	1.0	3.0	2.0	Open	In stump hole.
2	R. lac.	2.0	1.5	3.0	2.0	Open	In stump hole.
3	R. lac.	2.0	1.0	2.0	1.0	Open	In stump hole.
4	R. lac.	5.0	5.0	35.0	33.0	Open	Upturned stump.
5	R. lac.	4.0	4.0	12.0	12.0	Open	Upturned stump.
6	R. lac.	5.0	5.0	35.0	35.0	Open	Upturned stump.
7	R. lac.	1.3	1.0	2.3	2.0	Open	In upturned stump hole.
8	R. lac.	4.0	3.5	10.0	8.0	Open	In upturned stump hole.
9	R. lac.	1.5	0.8	1.5	0.8	Open	In upturned stump hole.
10	R. lac.	0.8	0.6	1.2	1.0	Open	In upturned stump hole.

Adjoining Plot X on S.

Elk River - Block 3 - 1923 Strip 1 - 1/20 Acre

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	3.0	3.0	12.0	10.0	Open	About 2 chains E. of Creek.
2	R. lac.	3.5	3.0	7.0	6.0	Open	About 50' W. of Creek 3' N. of trail.

NW 1/4 NE. 1/4 Sec. 2 T39 N.R. 2E. in bend of creek adjoining sec. line. 1/8 x 4 chains area of above check.

ELK RIVER - BLOCK 3 - 1923 STRIP 2 - .1875 ACRES

No.	Species of Ribes	Chains	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	5.3	2.5	1.5	4.5	4.0	Open	Edge of 7 year burn. S. slope.
2	R. lac.	8.8	1.0	1.0	2.5	2.5	Medium	N. S. slope steep.
3	R. lac.	9.5	2.0	2.0	5.0	5.0	Open	N. S. slope steep.
4	R. pet.	14.2	4.0	4.0	25.0	23.0	Open	N. S. slope gentle.
5	R. lac.	14.5	3.0	3.0	15.0	14.0	Light	N. S. slope gentle.
6	R. vis.	14.5	5.5	5.5	20.0	19.0	Open	N. S. slope gentle.
7	R. vis.	15	2.5	2.0	2.5	2.0	Medium	N. slope gentle. Edge heavy timber shade.

Several Ribes seen in 7 year burn NE. Corner Block 3 Running S. on line between block beginning 5 chains S. of N. edge. 15 chains S. to SW. Cor. Block 4.

ELK RIVER - BLOCK 3 - 1923 STRIP D - .05 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S. June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	1.5	1.5	3.0	3.0	Heavy	2' below train 0.2 chains.
2	R. lac.	1.0	1.0	1.5	1.5	Open	In trail 0.4 chains.
3	R. lac.	1.0	0.6	1.0	0.6	Open	In trail 0.4 chains.

ELK RIVER - BLOCK 3 - 1923 STRIP D - .05 ACRE (Continued) 1

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
4	R. lac.	1.0	0.8	1.0	0.8	Open	In trail 0.4 chains.
5	R. lac.	3.0	2.5	5.0	4.5	Open	2' below trail 0.7 chains.
7	R. lac.	1.0	0.6	1.0	0.6	Open	In trail 1.2 chains.
8	R. lac.	3.0	2.0	4.5	3.0	Open	2' above trail 2 chains.
9	R. lac.	1.5	1.0	1.5	1.0	Open	Ditto
10	R. lac.	3.0	3.0	5.0	4.0	Open	Ditto
11	R. lac.	1.0	1.0	1.0	1.0	Open	Edge trail 2 chains.
12	R. lac.	0.8	0.2	0.8	0.2	Open	Ditto
13	R. lac.	4.0	4.0	20.0	20.0	Open	1' below trail 3.4 chains.
14	R. lac.	0.8	0.5	0.8	0.5	Open	1' above trail 3.6 chains.
15	R. lac.	0.8	0.5	0.8	0.5	Open	2' above trail 3.6 chains.

Along trail down Creek W. line of block.
In S. forty 1/8 chains x 4 chains.

ELK RIVER - BLOCK 3 - 1923 PLOT X - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. lac.	4.5	4.0	12.0	10.0	Heavy	In brush.
2	R. lac.	3.0	2.5	8.0	7.0	Heavy	Ditto
3	R. lac.	2.5	1.0	6.0	2.0	Heavy	Ditto
4	R. lac.	3.0	2.5	3.0	2.5	Heavy	Ditto
5	R. lac.	1.5	1.0	1.5	1.0	Heavy	Ditto
6	R. lac.	1.5	0.5	1.5	0.5	Heavy	Ditto
7	R. lac.	0.8	0.4	1.5	1.0	Heavy	Ditto
8	R. lac.	6.0	5.5	20.0	18.0	Heavy	Ditto
9	R. lac.	3.0	3.0	12.0	10.0	Heavy	Ditto
10	R. lac.	5.5	5.0	70.0	60.0	Light	Ditto
11	R. lac.	3.0	3.0	15.0	17.0	Heavy	
12	R. lac.	3.0	3.0	20.0	19.0	Heavy	
13	R. lac.	4.0	3.0	15.0	12.0	Light	
14	R. lac.	5.5	5.5	130.0	120.0	Light	
15	R. lac.	2.0	1.5	3.0	2.0	Heavy	

ELK RIVER - BLOCK 3 - 1923 PLOT X - 1/2 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
16	R. lac.	1.0	0.6	1.0	0.6	Heavy	
17	R. lac.	6.0	5.5	50.0	48.0	Light	
18	R. lac.	4.5	4.0	15.0	13.0	Heavy	
19	R. lac.	5.0	5.0	15.0	14.0	Heavy	
20	R. lac.	8.0	7.5	20.0	19.0	Heavy	
21	R. lac.	3.0	2.0	9.0	6.0	Light	
22	R. lac.	5.0	4.0	25.0	20.0	Light	
23	R. lac.	6.5	6.0	40.0	38.0	Light	
24	R. lac.	4.5	4.0	20.0	18.0	Light	
25	R. lac.	7.0	6.5	70.0	68.0	Light	
26	R. lac.	2.0	1.3	10.0	6.0	Light	
27	R. lac.	0.6	0.3	1.0	0.3	Open	
28	R. lac.	1.0	1.0	6.0	3.0	Open	
29	R. lac.	1.0	0.6	1.0	0.6	Medium	
30	R. lac.	2.0	1.5	7.0	5.0	Medium	

ELK RIVER - BLOCK 3 - 1923 PLOT X - 1/2 ACRE (Continued) 2.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
31	R. lac	2.0	0.5	8.0	3.0	Medium	
32	R. lac.	1.0	0.7	4.0	2.0	Open	
33	R. lac.	0.4	0.2	0.4	0.2	Open	
34	R. lac.	2.5	1.5	15.0	10.0	Open	
35	R. lac.	1.0	1.0	1.3	1.3	Open	
36	R. lac.	3.5	5.0	25.0	24.0	Open	
37	R. lac.	1.5	1.0	3.0	2.0	Open	
38	R. lac.	1.5	1.5	1.5	1.5	Heavy	10' SE. of trail all in 12' circle from which 6 or 8 bushes were pulled 1922.
39	R. lac.	2.0	2.0	5.0	4.0	Heavy	Ditto
40	R. lac.	1.0	0.4	1.0	0.4	Light	Ditto
41	R. lac.	0.4	0.2	0.4	0.2	Light	Ditto
42	R. lac.	2.5	2.5	2.5	2.5	Light	Ditto
43	R. lac.	1.5	1.5	1.5	1.5	Light	Ditto
44	R. lac.	1.5	1.5	1.5	1.5	Light	Ditto
45	R. lac.	1.0	0.5	1.0	0.5	Light	Ditto

ELK RIVER - BLOCK 3 - 1923 PLOT X - 1/2 ACRE (Continued) 3

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
46	R. lac.	1.8	1.0	1.8	1.0	Light	10' SE. of trail all in 12' circle from which 6 or 8 bushes were pulled 1922.
47	R. lac.	4.5	4.5	10.0	10.0	Heavy	Ditto
48	R. lac.	1.0	0.6	1.0	0.6	Heavy	Ditto
49	R. lac.	1.5	1.5	1.5	1.5	Light	Ditto
50	R. lac.	1.5	1.5	1.5	1.5	Light	Ditto
51	R. lac.	1.5	1.5	1.5	1.5	Light	Ditto
52	R. lac.	2.0	2.0	2.0	2.0	Light	Ditto
53	R. lac.	1.0	1.0	1.0	1.0	Light	Ditto
54	R. lac.	0.5	0.4	0.5	0.4	Light	Ditto
55	R. lac.	2.0	1.5	2.0	1.5	Light	Ditto
56	R. lac.	1.0	0.5	1.0	0.5	Light	Ditto
57	R. lac.	1.5	1.5	2.5	1.5	Light	Ditto
58	R. lac.	0.8	0.4	0.8	0.4	Light	Ditto
59	R. lac.	0.4	0.2	0.4	0.2	Open	Ditto
60	R. lac.	2.5	2.5	3.5	3.5	Open	Ditto

ELK RIVER - BLOCK 3 - 1923 PLOT X - 1/2 ACRE (Continued) 4.

No.	Species of Ribes	Height June 1923 Ft.	Height Ft. 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
61	R. lac.	2.0	2.0	4.0	3.0	Medium	10' SE. of trail all in 12' circle from which 6 or 8 bushes were pulled 1922.
62	R. lac.	0.4	0.2	0.4	0.2	Open	Ditto
63	R. lac.	0.8	0.3	3.0	0.6	Light	Ditto
64	R. lac.	2.5	2.5	5.0	4.0	Light	
65	R. lac.	0.8	0.8	6.0	4.0	Heavy	N. W. of trail.
66	R. lac.	1.5	1.5	1.5	1.5	Heavy	
67	R. lac.	0.6	0.6	0.6	0.6	Heavy	
68	R. lac.	0.5	0.5	0.5	0.5	Heavy	
69	R. lac.	2.0	2.0	4.0	3.0	Heavy	
70	R. lac.	2.5	2.5	2.5	2.5	Heavy	
71 to 80	R. lac.	0.8	0.5	0.8	0.5	Heavy	
81	R. lac.	4.0	4.0	12.0	12.0	Heavy	3' from pulled bushes.
82	R. lac.	4.5	4.0	15.0	14.0	Open	6' from pulled bushes.
83	R. lac.	4.0	3.5	35.0	32.0	Open	16' E. of trail.
84	R. lac.	4.5	4.5	15.0	15.0	Heavy	6' E. of trail.

Level at N.W. Corner. Gentle SW. at SW. Corner. Steep E.NE. at NE. Corner Steep E-NE. at SE. Corner. Topography.
Scattered mature W.P.-W.F- Cedar and reproduction. Heavy brush mixed.

TABLE 47

ELK RIVER - BLOCK 4 - 1923 PLOT 1 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. vis.	9.0	8.0	20.0	18.0	Heavy	Second growth open mature stand.
2	R. vis.	6.0	6.0	9.0	8.0	Heavy	Brush open mature stand.
3	R. vis.	7.0	6.5	9.0	8.0	Heavy	Brush. Heavy mature cover.
4	R. vis.	4.0	3.5	12.0	10.0	Heavy	Ditto
5	R. vis.	0.8	0.5	0.8	0.5	Heavy	Very low ground cover. Heavy mature cover.
6	R. vis.	1.5	1.2	1.5	1.2	Heavy	Ditto
7	R. vis.	1.5	1.2	2.0	1.5	Heavy	Ditto
8	R. vis.	7.0	6.5	15.0	13.0	Heavy	Second growth. Heavy mature cover.
9	R. vis.	6.0	5.5	15.0	13.0	Heavy	Heavy brush. Opening in trees.
10	R. vis.	5.5	5.0	12.0	10.0	Heavy	Ditto
11	R. vis.	6.0	5.5	20.0	15.0	Medium	Second growth. Opening in trees.
12	R. vis.	4.0	3.5	10.0	8.0	Medium	Ditto
13	R. vis.	5.0	4.0	8.0	7.0	Open	Ditto
14	R. vis.	6.0	5.5	12.0	10.0	Heavy	Ditto
15	R. vis.	3.5	3.0	6.0	5.0	Heavy	Ditto

This is on a SW. slope with open stand mature W.P.W.F.D.F. and heavy 2nd growth 1 chain square. Location NE. corner is approximately 5 chains S. of NE. cor. Sec. 2, W.F. 60% W.P. 30% D.F. 10% T 39 R 2W.

ELK RIVER - BLOCK 4 - 1923 PLOT 2 - 1/10 ACRE

Area 1 chain square. Location NE. corner is NE. corner Sec. 2.
Heavy second growth W.F. 80%. W.P. 15% D. F. 4% Cedar 10%.
No Ribes.
Scattered 6" to 18" trees, larch, D. F. W. F. NW. slope.

ELK RIVER - BLOCK 4 - 1923 PLOT 3 - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	1.5	1.0	12.0	8.0	Open	Very little vegetation.
2	R. vis.	1.5	1.5	25.0	15.0	Open	No other vegetation.
3	R. vis.	2.0	1.5	15.0	9.0	Open	Very little vegetation.
4	R. vis.	1.5	0.8	1.5	0.8	Medium	In Salix 9' SE. NW. Cor. Block.
5	R. vis.	1.2	0.7	1.2	0.7	Medium	Ditto
6	R. vis.	0.4	0.2	0.4	0.2	Medium	Ditto
7	R. vis.	2.0	1.5	15.0	10.0	Open	Very little vegetation.
8	R. vis.	1.0	1.0	12.0	10.0	Open	Ditto
9	R. vis.	1.5	1.0	15.0	10.0	Open	Ditto

ELK RIVER - BLOCK 4 - 1923 PLOT 4 - 1/2 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	
1	R. lac.	2.5	2.0	15.0	10.0	Open	Low brush.
2	R. lac.	2.0	1.5	6.0	4.0	Open	Low brush.

ELK RIVER - BLOCK 4 - 1923 PLOT 4 - 1/2 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
3	R. lac.	2.5	2.0	25.0	20.0	Open	Low brush.
4	R. vis.	0.5	-	0.5	-	Open	Seedlings.
5	R. vis.	1.5	1.0	3.0	2.0	Light	Herbaceous associates.
6	R. vis.	1.5	1.0	1.5	1.0	Light	Herbaceous associates. All in 16' circle.
7	R. vis.	0.5	0.3	0.5	0.3	Light	Ditto
8	R. vis.	2.0	1.0	6.0	3.0	Open	Ditto
9	R. vis.	1.5	1.0	2.0	1.0	Open	Ditto
10	R. vis.	1.5	1.0	1.5	1.0	Open	Ditto
11	R. vis.	1.0	0.3	3.0	0.8	Open	Herbaceous associates. All in 16' circle.
12	R. vis.	1.0	1.0	2.0	1.2	Open	Ditto
13	R. vis.	0.8	0.5	2.0	0.2	Open	Ditto
14	R. vis.	1.0	0.8	1.0	0.8	Open	Ditto
15	R. vis.	1.0	0.8	1.0	0.8	Light	Herbs. All in 16' circle.
16	R. vis.	0.5	0.3	0.5	0.3	Light	Ditto
17	R. vis.	0.4	0.2	0.4	0.2	Light	Ditto
18	R. vis.	1.5	1.0	3.0	1.5	Medium	With thimbleberry.
19	R. vis.	1.0	0.7	1.0	0.7	Light	

ELK RIVER - BLOCK 4 - PLOT 5 - 0.45 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft.L.S. June 1923	Feet L.S. 1922	Degree of Concealment	Special Notes
1	R. vis.	0.5	0.2	3.0	1.0	Open	No other vegetation. 6 chains E.& 12'S. of NW. Cor. block 4 S. slope.
2	R. vis.	1.5	1.0	5.0	2.0	Light	Scattered brush 9 chains E. & 3'S. of NW. cor. block 4. S. slope.
3	R. vis.	4.5	4.0	50.0	40.0	Light	Scattered brush 9.5 chains E.& 6'S. of NW. cor. block 4 S. slope.
4	R. vis.	3.0	2.5	20.0	15.0	Light	Scattered brush 11 chains E. & 12' S. of NW. cor. block 4 S. slope.
5	R. vis.	3.5	3.0	15.0	10.0	Light	Scattered brush 11 chains E. & 10' S. of NW. cor. block 4 S. slope.
6	R. vis.	2.5	1.5	2.5	1.5	Light	Scattered brush 11.2 chains E.& 10' S. of NW. cor. block 4 S. slope.
7	R. vis.	1.7	1.5	4.5	2.5	Open	Bare. 11.5 chains E. & 6' S. of NW. cor. block 4 S. slope
8	R. vis.	2.5	2.0	12.0	10.0	Open	Scattered herbs. 11.5 chains E. & 16' S. of NW. cor. block 4 S. slope.
9	R. vis.	1.2	1.0	6.0	3.0	Open	Bare. 12.2 chains E. & 10' S. of NW. cor. block 4 S. slope.
10	R. vis.	2.5	1.5	6.0	2.0	Light	Scattered brush 13.0 chains E. & 10' S. of NW. cor. block 4 S. slope.
11	R. vis.	1.3	1.0	1.3	1.0	Light	Scattered brush 13.1 chains E. & 10' S. of NW. cor. block 4 S. slope.
12	R. vis.	0.8	0.3	2.0	0.8	Open	No vegetation 13.9 chains E. & 10' S. of NW. cor. block 4 S. slope.
13	R. vis.	0.7	0.3	0.7	0.3	Light	Herb. 13.9 chains E. & 12' S. of NW. cor. block 4 S. slope.
14	R. vis.	0.5	0.2	0.5	0.2	Medium	Herb. 14.5 chains E. & 8' S. of NW. cor. block 4 S. slope.
15	R. vis.	1.0	0.5	4.0	1.5	Light	Herb. 14.5 chains E. & 12' S. of NW. cor. block 4 S. slope.

ELK RIVER - BLOCK 4 - 1923 PLOT 5 - 0.45 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
16	R. vis	0.7	0.3	0.7	0.3	Medium	Herbs. 14.5 chains E. &12' S. N. W. Corner Block 4S. Slope.
17	R. vis.	9.0	8.5	15.0	13.0	Heavy	Timber 2nd growth 19 chains E. &2' S. of NW. Cor. Block 4 S. slope.

1/4 x 18 chains. Running E. along N. side of block.
Checked out on corner at 22 chains in open 100 year stand with dense. reproduction under-story 30-40 years.

ELK RIVER - BLOCK 4 - 1923 PLOT 6 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	8.0	7.0	25.0	24.0	Open	
2	R. vis.	8.0	7.5	60.0	55.0	Open	

6 chains W. & 1 chain N. SE. Corner Block 4.

Most of S. part of Block 4 too densely shaded for Ribes growth. Generally occur only in openings. Logged this past winter.

ELK RIVER - BLOCK 4 - 1923 PLOT 7 - 1/10 ACRE

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
1	R. vis.	1.5	1.0	4.0	3.5	Open	
2	R. vis.	1.5	1.0	1.5	1.0	Open	

ELK RIVER - BLOCK 4 - 1923 PLOT 7 - 1/10 ACRE (Continued) 1.

No.	Species of Ribes	Height June 1923 Ft.	Height Feet 1922	Ft. L. S June 1923	Feet L. S. 1922	Degree of Concealment	Special Notes
3	R. vis.	5.0	5.0	15.0	14.0	Open	
4	R. vis.	3.0	3.0	3.0	3.0	Open	
5	R. vis.	4.0	4.0	10.0	10.0	Open	
6	R. vis.	2.0	1.5	2.0	1.5	Open	
7	R. vis.	1.0	0.6	1.0	0.6	Open	
8	R. vis.	1.3	1.0	3.0	2.5	Open	
9	R. vis.	1.0	1.0	5.0	4.0	Open	
10	R. vis.	1.5	1.0	2.5	2.0	Open	
11	R. vis.	2.5	2.0	5.0	4.5	Open	
12	R. vis.	4.0	3.5	10.0	9.0	Open	
13	R. vis.	1.5	1.5	3.0	3.0	Open	
14	R. vis.	2.0	1.8	2.0	1.8	Open	
15	R. vis.	2.5	2.5	4.5	4.5	Open	
16	R. vis.	4.5	3.5	17.0	15.0	Open	

About 4 chains N. & 4 chains E. from SW Cor.

1923 CHECK ALDER CREEK, IDAHO

Table 48

Average of Entire Block

	Species	No. Bushes Per Acre	No. Bushes Per Acre by Ht. Classes ½	1	2	4	4	5	10	Av. Ht. Bushes	Total L.S. Per Acre	L. S. by Size Classes - Per Acre ½	1	2½	5	10	15	20	25	50	100	200Up	Per Acre Degree Concealment Heavy	Medium	Light	Open
1922 Eradication	R. vis.																									
	R. lac.																									
	G. irr.																									
	Total	321																								
1923 Check	R. vis.	101.2	15.5	20.4	22.8	18.8	14.7	6.5	2.5	2.23													8.2	18.8	14.7	59.6
	R. lac.	27.8	3.3	9.0	4.1	7.3	3.3	0.8		1.97													6.5	3.3	6.5	11.4
	G. irr.	35.1	3.3	3.3	7.3	5.7	5.7	5.7	4.1	3.29													4.9	2.5	10.6	17.1
	Total	164.1									1,297.3												19.6	24.6	31.8	88.1

2 Year Total

	Species																									
% Efficiency 1922 Eradication	R. vis.																									
	R. lac.																									
	G. Irr.																									
	Total	66.18																								

Average of Crew Work.

1922 Eradication	R. vis.	508.	10.	53.	94.	126.	41.	184.			6,192.	4.	41.	271.	633.	929.	639.	526.	793.	1014.	771.	571.	3.0	86.0	329.0	90.0
	R. lac.	136.	4.	12	23	33	12	52			2,190	1.3	10	65.7	140	254	163	206	264	343	286	457	7.0	23.0	83.0	23.0
	G. irr.	55	1	3	8	11	4	28			1,527.7	0.3	1.3	17.	67.	103.	77.	69.	93.	186.	171	743	1.0	8.0	34.0	12.0
	Total	699.	15.	68.	125.	170.	57.	264.			9,909.7	5.6	52.3	353.7	840.	1286.	879.	801.	1150.	1543.	1228.	1771.	11.0	117.0	446.0	125.0
1923 Check	R. vis.	267.5	47.5	60.0	60.0	42.5	35.0	15.0	7.5	2.13	1,399.1	15.5	41.0	111.3	181.3	195.	212.5	315.	232.5	95.0			20.0	45.0	40.0	162.5
	R. lac.	82.5	10.0	27.5	12.5	20.0	10.0	2.5		1.96	447.1	3.3	15.0	33.8	65.0	875	97.5	145.					20.0	10.0	20.0	32.5
	G. irr.	20.0	7.5	7.5	5.0					1.51	35.3	1.5	7.5	8.8		17.5							12.5		5.0	2.5
	Total	370.0	65.0	95.0	77.5	62.5	45.0	25.0			1,881.5	20.3	63.5	153.9	246.3	300.0	310.0	460.0	232.5	95.0			52.5	55.0	65.0	197.5
Efficiency 1922 Eradication	R. vis.	65.5	17.4	46.9	61.0	74.8	53.9	89.1			81.6	20.5	50.0	70.9	77.8	82.7	75.1	62.5	77.4	91.4	100.	100.	13.0	65.6	89.1	35.6
	R. lac.	62.5	28.5	30.4	64.8	62.3	80.4	95.4			83.0	28.2	40.0	65.3	68.3	74.2	62.5	58.7	100.0	100.0	100.	100.	25.9	70.0	80.6	41.4
	G. irr.	73.3	11.7	28.6	61.5	100.	100.	100.			97.6	16.6	14.8	65.9	100.0	85.4	100.0	100.0	100.0	100.0	100.	100.	7.4	100.0	87.2	82.7
	Total	65.4	18.8	41.7	61.7	73.1	55.9	91.7			84.0	21.9	43.2	69.6	77.4	81.8	73.9	63.5	83.2	94.2	100.	100.	17.3	68.0	87.2	38.7

Average of Scouting Work

1922 Erad. Ribes		117.4																								
1923 Check "		64.2								3.42	968.1												3	8	13	29
% Efficiency "		64.6																								

1923 CHECK - BLOCK 2 - BOVILL, IDAHO

TABLE 49

Average of Entire Block

	Species	No. Bushes Per Acre	No. Bushes per Acre by Height Classes ½	1	2	3	4	5	10	Av.Ht. Bushes	Total L. S. per A.	Total Live Stem per Acre by Size Classes ½	1	2½	5	10	15	20	25	50	100	200	Degree Concealment per A. Heavy	Medium	Light	Open
1922 Eradication	Ribes	169.7	19.0	32.6	37.4	28.9	10.8	41.0		2.54													51.7	69.9	45.4	5.0
1923 Check	R. lac.	56.7	5.83	13.8	10.6	4.8	4.2	5.7															2.88	0.8	11.5	13.2
% Efficiency 1922		74.9	76.5	71.0	77.9	85.8	72.0	87.8															94.6	98.9	79.8	27.5

Average of Crew Work

1922 Eradication	R. lac.	625.	69.	123.	136.	105.	43.0	149.			3418.	26.	118.	436.	748.	835.	379.	218.	268.	164.	127.	109.	188.	254.	165.	18.
	R. pet.	2.8		0.2	0.2	0.2		2.2			28.2		0.2	1.0	5.	4.	5.		13.				0.2	2.6		
	R. vis.	0.6					0.2	0.4			40.				1.		3.					36.			0.6	
	Total	628.4	69.	123.2	136.2	105.2	43.2	151.6			3486.2	26.	118.2	437.0	754.	839.	387.	218.	281.	164.	127.	145.	188.2	256.6	165.6	18.
1923 Check	R. lac.	118.	8.	50.	28.	12.	10.	4.	6.	1.89	236.9	2.6	44.8	35.0	35.0	130.0		38.0		130.0			11.	3.	26.	19.
	R. pet.																									
	R. vis.																									
	Total	118.	8.	50.	28.	12.	10.	4.	6.	1.89	236.9	2.6	44.8	35.0	35.0	130.0		38.0		130.0			11.	3.	26.	19.
% Efficiency 1922	R. lac.	84.11	89.61	71.09	82.92	89.74	81.13	93.71			93.5	90.9	72.5	92.4	95.5	86.5	100.0	85.1	100.0	55.8	100.0	100.0	94.5	98.8	86.38	48.6
	R. pet.																						100.0	100.0		
	R. vis.																								100.0	
	Total	64.2	9.0	71.1	82.9	89.9	81.2	93.8		57.3	93.7	90.9	72.5	85.1	95.6	85.7	100.0	85.1	100	55.8	100.0	100.0	94.5	98.8	86.4	48.6

Average of Scouting Only

1922 Eradication		0									0												0	0	0	0
1923 Check	R. lac.	17	5.0		4.	2.	2.	1.	3.	2.61	181.0	1.2		4.3	12.5	10.0	12.0	20.0		123.0					6.	11.
% Efficiency 1922		0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0					0.0	0.0

1923 CHECK - BLOCK 3 - BOVILL, IDAHO

Table 50

Average of Entire Block

	Species	No. Bushes Per Acre	No. Bushes per Acre by Ht. Classes 1/2	1	2	3	4	5	10	Av. Ht. Bushes	Total L. S. per A.	Total Live Stem per Acre by Size Classes 1/2	1	2 1/2	5	10	15	20	25	50	100	200	Degree Concealment per A Heavy	Medium	Light	Open
1922 Eradication	R. pet.																									
	R. lac.																									
	Total	119																								
1923 Check	R. pet.	52.3	0.5	5.9	11.8	11.8	16.4	5.0	0.9		697.5	0.2	4.5	16.6	23.9	109.1	52.7	65.5	53.2	122.3	127.2					
	R. lac.	0.5			0.5									0.9												
	Total	52.8	0.5	5.9	12.3	11.8	16.4	5.0	0.9		697.5	0.2	4.5	17.5	23.9	109.1	52.7	65.5	53.2	122.3	127.2					
% Efficiency 1922	R. pet.																									
	R. lac.																									
	Total	69.3																								

Average of Crew Work

1922 Eradication	R. pet.	295.3	0.3	10.5	21.0	28.0	17.2	218.3			7012.1	0.1	9.	63.	204.	555.	484.	710.	1300.	1262.0	1425.	1000.	73.	121.2	56.0	45.0
	R. lac.	300.	11.	45.0	66.	69.	35.	74.			2576.0	8.0	36.	177.	334.	565.	319	275.	362	250.	150	100.	17.0	176.2	106.0	0.75
	Total	595.3	11.3	55.5	87.0	97.0	32.2	292.3			9588.1	6.1	45.	240.	538.	1120.	803	985.	1662	1512.0	1575	1100.	90.0	297.4	162.0	45.75
1923 Check	R. pet	287.5	2.5	32.5	65.0	65.0	90.0	27.5	5.0		3836.3	1.3	25.0	91.2	131.3	600.0	290.0	360.0	292.5	1345.0	700.0					
	R. lac.	2.5			2.5						5.0			5.0												
	Total	290.0	2.5	32.5	67.5	65.0	90.0	27.5	5.0		3841.3	1.3	25.0	96.2	131.3	600.0	290.0	360.0	292.5	1345.0	700.0					
% Efficiency 1922	R. pet.		9.1	24.4	24.4	30.1	16.1	88.8	0.0		64.6	7.1	25.0	40.9	60.8	48.1	62.5	66.3	81.6	48.4	67.0	100.0				
	R. lac.	0.8	100.	100.	96.3	100.	100.	100.			99.8	100.0	100.0	97.3	100.0	100.0	100.	100.	100.	100.	100.0	100.				
	Total		89.9	63.1	56.3	59.9	36.8	91.4	0.0		71.4	82.4	64.3	71.4	80.4	65.1	73.5	73.2	85.1	52.9	69.2	100.0				

Average of Scouting Work

1922 Eradication		7.5																								
1923 Check		0																								
% Efficiency 1922		100.0																								

Table 51

1923 CHECK - BLOCK 1 - ELK RIVER, IDAHO.

Average of Entire Block

	Species	No. Bushes Per Acre	No. Bushes per Acre by Height Classes ½	1	2	3	4	5	10	Av.Ht. Bushes	Total L. S.per A.	Total Live Stem per Acre by Size Classes ½	1	2½	5	10	15	20	25	50	100	200	Degree Concealment per A Heavy	Medium	Light	Open
1922 Eradication	R. vis.	122.5	0.5	6.0	27.0	48.0	33.0	8.0			2,797.	0.1	4.1	26.	95.	211.	223.	231.	846.	807.	571.	142.9	5.0	24.5	59.	34.
	R. lac.	0.7		0.2	0.2	0.2	0.1				5.		0.1	0.4	1.0	2.	1.5						0.1	0.2	0.2	0.2
	Total	123.2	0.5	6.2	27.2	48.2	33.1	8.0			2,782.	0.1	4.1	26.4	96.0	213.	224.5	231.	846.	807.	571.	142.9	5.1	24.7	59.2	34.2
1923 Check	R. vis.	37.7	11.6	10.8	8.7	4.5	1.5	0.5				3.3	7.4	11.5	27.3	24.0	14.7	6.6		21.5	10.0		8.9	10.3	9.2	9.3
	R. lac.	0.68	0.03	0.2	0.3	0.1		0.04			5.6		0.04	0.3	0.2	2.3			1.0	1.7			0.05	0.2	0.1	0.33
	Total	38.28	11.63	11.0	9.0	4.6	1.5	0.54			5.6	3.3	7.44	11.8	27.5	26.3	14.7	6.6	1.0	23.2	10.0		8.95	10.5	9.3	9.63
% Efficiency 1922	R. vis.	76.5	4.1	35.7	75.6	91.4	95.7	94.2				2.9		69.3	77.6	89.7	93.8	97.3	100.0	97.4	98.3	100.0	36.0	70.4	86.5	78.5
	R. lac.	50.8	0.0	50.0	40.0	67.0	100.0	0.0					71.4	57.1	83.0	46.5	100.0		0.0	0.0			66.7	50.0	66.7	37.7
	Total	76.3	4.1	36.0	75.1	91.3	95.4	93.7				2.9	35.5	69.1	77.7	89.0	93.8	97.3	99.9	97.2	98.3	100.0	36.3	70.1	86.4	77.5

Table 52

1923 CHECK - BLOCK 2 - ELK RIVER, IDAHO.

Average of Entire Block

1922 Eradication	R. vis.	0.17																								
	R. lac.	0.08																								
	Total	0.25																								
1923 Check	R. vis.	4.33								2.99	193.2												0.0	0.67	1.67	1.33
	R. lac.																									
	Total	4.33								2.99	193.2												0.0	0.67	1.67	1.33
% Efficiency 1922	R. vis.	3.8																								
	R. lac.	100.0																								
	Total	5.5																								

Table 53

1923 CHECK - BLOCK 3 - ELK RIVER, IDAHO

Average of Entire Block

	Species	No. Bushes Per Acre	No. Bushes per Acre by Height Classes ½	1	2	3	4	5	10	Av. Ht. Bushes	Total L. S. per A.	Total Live Stem per Acre by Size Classes ½	1	2½	5	10	15	20	25	50	100	200	% Concealment per Acre Heavy	Medium	Light	Open
1922 Eradication	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	59.									7,273.															
1923 Check	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	77.1								2.05																
% Efficiency 1922	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	43.3																								

Average of Crew Work

1922 Eradication	R. lac.	354.	7.	62.	81.	76.	41.	87.			3,209.	2.	53.	227.	475.	588.	248.	236.	330.	346.	222.	482.	141.	139.	72.	3.
	R. pet.	207.	2.	17.	27.	31.	18.	112.			4,057.4	0.4	16.	82.	215.	351.	266.	358.	517.	611.	574.	1067.	124.	60.	18.	5.
	R. vis.	0.1						0.1			7.										7.				0.1	
	Total	561.1	9.	79.	108.	107.	59.	199.1			7,273.4	2.4	69.	309.	690.	939.	514.	594.	847.	957.	803.	1549.	265.	199.	90.1	8.
1923 Check	R. lac.	133.1	22.2	33.3	24.4	17.7	15.5	20.0			1,047.2	6.7	24.9	24.0	90.	82.2	164.0	126.6	144.4	84.4	300.0		31.1	11.1	42.2	44.4
	R. pet.	64.1	11.1	11.1	4.0	15.6	6.7	15.6			1,190.7	4.4	4.4	13.3	48.9	57.7	28.8	44.4	55.5	166.7	455.6	311.	35.5	2.2	20.0	6.7
	R. vis.	35.5	13.3	6.7	8.9	4.4		2.2																4.4	20.0	11.1
	Total	232.7	46.6	51.1	37.3	37.7	22.2	37.8	2.1		2,237.9	11.1	29.3	37.3	139.	139.9	192.8	171.0	199.9	251.1	755.6	311.	66.6	17.7	82.2	122.2
% Efficiency 1922	R. lac.	72.7	23.9	64.6							75.4	23.0	67.8	90.4	841	89.8	60.2	653	69.6	80.6	42.5	100.				
	R. pet.	76.3	15.26	60.49							77.3	8.3	79.4	86.0	81.5	85.9	83.4	88.9	90.3	78.6	55.8	77.4				
	R. vis.	0.2	.0	.0							100.0	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.				
	Total	70.7	16.10	60.72	74.32	73.94	72.66	84.0			74.3	17.7	70.2	89.2	84.3	87.0	72.6	79.6	80.9	79.6	51.6	83.2	79.8	91.2	52.2	6.2

Average of Scouting

1922 Eradication	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	5.5																								
1923 Check	R. lac.	49.4	6.2	10.5	13.8	9.1	4.4	5.4			412.5	2.0	3.7	18.6	31.4	24.0	68.0	66.5	26.1	82.1	90.1		11.3	2.2	19.3	16.7
	R. pet.	0.4					0.4				8.3								8.3							0.4
	R. vis.	9.1	0.4	2.9	2.5	0.7	1.1	1.5			72.3	0.1	0.6	3.6	12.1	9.8	10.5	6.9	8.7		20.0		0.7	0.7		7.6
	Total	58.9	6.6	13.4	16.3	9.8	5.9	6.9	2.01		493.1	2.1	4.3	22.2	43.5	33.8	78.5	73.4	43.1	82.1	110.1		12.0	2.9	19.3	24.7
% Efficiency 1922	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	8.5																								

Table 54

-085-

1923 CHECK - BLOCK 4 - ELK RIVER, IDAHO

Average of Scouting Work

1922 Eradication	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	6.9									32.8															
1923 Check	R. lac.				1.1										4.0	10.0										
	R. pet.																									
	R. vis.	41.7	7.0	12.9	7.0	2.7	3.9	1.1	53			1.2	6.4	13.8	18.1	79.5	45.9	9.7	13.0		55.0					
	Total	42.7	7.0	12.9	8.1	2.7	3.9	1.1	5.3		272.8	1.2	6.4	13.8	22.1	89.5	45.9	9.7	13.0		55.0					
% Efficiency 1922	R. lac.																									
	R. pet.																									
	R. vis.																									
	Total	13.01									10.73															

Table 55

SUMMARY OF EFFICIENCY CHECKS
IDAHO 1923

Block	Acres Erad. 1922	% Efficiency by 1922 Check: Crew Check No.B.	Crew Check Ft.L.S.	Inspection Check No.B.	Inspection Check Ft.L.S.	Advance Plot Check No.B.	Advance Plot Check Ft.L.S.	Scouting No.B.	Scouting Ft.L.S.	Average Entire Block No.B.	Average Entire Block Ft.L.S.	Acreage Checked 1923	% Efficiency by 1923 Check: 1922 Erad. & Crew Check No.B.	1922 Erad. & Crew Check Ft.L.S.	1922 Erad. & Insp. Checks No.B.	1922 Erad. & Insp. Checks Ft.L.S.	1922 Erad. & Advance Plots No.B.	1922 Erad. & Advance Plots Ft.L.S.	Scouting No.B.	Scouting Ft.L.S.	Average Entire Block No.B.	Average Entire Block Ft.L.S.
Alder Creek Block 1	10											1.225	65.4	83.4					64.6		66.2	
Bovill Block 1	10			100.0	100.0							1.0			0.0	0.0			0.0	0.0	0.0	0.0
Bovill Block 2	20	97.5	98.6					100.	100.			1.5	84.2	93.7					0.0	0.0	74.9	
Bovill Block 3	21											2.2	67.2	71.4					*		69.3	
Elk River Block 1	21	67.2	94.4	88.0	97.3					67.2	94.4	21.0	76.3	95.4					All	Crew Work	76.3	95.4
Elk River Block 2	12			100.0	100.0							3.0			0.0	0.0			5.5		5.5	
Elk River Block 3	280	94.5	98.1									3.125	70.7	74.3					8.5		43.3	
Elk River Block 4	40			100.0	100.0							1.85			0.0	0.0			13.9		13.9	
Average Based on Acres	414	92.9										34.9	71.4	76.5	0.0	0.0			9.3		41.4	
Average Based on Blocks		86.4	97.0	97.0	99.3								72.8	83.8	0.0	0.0			15.4		43.7	
Elk River Block 1 Plot 1	0.1					100.0	100.0					0.1					81.6	95.3				
Elk River Block 1 Plot 2	0.1					100.0	100.0					0.1					70.0	98.8				
Elk River Block 1 Plot 3	0.1					100.0	100.0					0.1					71.4	95.8				
Elk River Block 2 Plot 1	0.1			No	Ribes	No	Ribes					0.1			No	Ribes	No	Ribes				
Elk River Block 2 Plot 2	0.1			No	Ribes	No	Ribes					0.1			No	Ribes	No	Ribes				
Elk River Block 3 Plot 7	0.1					98.8	99.5					0.1					66.2	93.5				
Average of Plots	0.6					99.7	99.9					0.6					72.3	95.9				

* Scouting not checked because boundary of crew work could not be located.

L. S. Class 1922	Heavy Concealment		Medium Concealment		Light Concealment		Open-no Concealment		Average of all Concealment		% of Increase in 1 Season's Growth	Estimated L. S. in Feet after Lapse 5 Years	No. of Times L. S. Multiplies in Five Year Period
	Growth in Feet	No. Bushes as Basis	Growth in Feet	No. Bushes as Basis	Growth in Feet	No. Bushes as Basis	Growth in Feet	No. Bushes as Basis	Growth in Feet	No. Bushes as Basis			
0- 1.0	.35	91	.35	111	.35	101	.60	85	.41	388	82.0	4.48	8.96
1.1- 2.0	.75	27	.60	29	.60	34	1.05	28	.75	118	50.0	5.95	3.97
2.1- 3.0	.65	11	1.25	17	.85	19	1.05	16	.95	63	38.0	7.84	3.14
3.1- 4.0	1.15	14	0.75	19	1.55	8	.80	25	1.06	66	30.3	9.59	2.74
4.1- 5.0	1.05	9	0.75	6	0.85	8	1.35	11	1.00	34	22.2	11.29	2.51
5.1-6.0	1.00	3	1.00	9	1.50	3	1.00	6	1.13	21	20.5	13.88	2.52
6.1- 7.0	.70	5	1.00	3	2.05	2	1.00	6	1.19	16	18.3	16.29	2.51
7.1- 8.0	2.00	4	1.00	3	1.00	6	2.00	3	1.50	16	20.0	18.17	2.42
8.1- 9.0	2.00	-	2.45	1	1.00	-	2.70	1	2.04	2	20.0*	20.42	2.40
9.1-10.0	2.00	4	1.40	4	6.00	3	3.30	1	3.18	12	20.0**	23.45	2.45
10.1-11.0	2.50	2	1.00	1	1.00	-	3.20	1	1.93	4	18.4	24.47	2.33
11.1-12.0	4.50	2	1.50	4	1.50	2	3.00	2	2.63	10	22.9	27.54	2.39
12.1-13.0	2.70	-	2.00	1	2.00	-	3.20	1	2.48	2	19.8	29.44	2.36
13.1-14.0	1.00	1	3.40	-	2.65	2	3.50	-	2.64	3	19.6	30.31	2.25
14.1-15.0	5.00	1	5.00	2	3.35	2	5.00	-	4.59	5	19.0***	31.92	2.20
15.1-20.0	2.80	5	4.20	-	4.00	2	2.00	1	3.25	8	18.6	37.47	2.14
20.1-25.0	3.60	-	3.35	-	4.30	-	3.50	-	3.69	-	16.4	50.47	2.24
25.1-30.0	4.50	2	2.50	2	4.65	1	5.00	1	4.16	6	15.1	63.60	2.31
30.1-35.0	4.80	-	6.40	-	5.00	-	5.00	1	5.30	1	16.3	78.38	2.41
35.1-40.0	5.00	1	10.00	1	10.00	-	5.00	-	7.50	2	20.0	93.31	2.49
Total Bushes	182		213		193		189		777				

* The actual figure is 24.0) These figures are so radically apart
** " " " " 34.7) from the average that interpolated
*** " " " " 31.7) figures are substituted.

The estimates of the amount of live stem after a lapse of 5 years are made by compounding annually each years growth to the ultimate five-year total.

The live stem of the bush for each class at the beginning of this five-year period is the mean of that class, as .5' for the 0' to 1.0' class, 1.5' for the 1.1' to 2.0' class, 2.5 for the 2.0' to the 3.0' class, etc.

LIGHT STUDY ELK RIVER 1923 CHECK BLOCK 1

In the check of Elk River Block 1, each missed Ribes bush was listed as to the directions from which it was visible.

To simplify the tabulations of the data the 360 degrees of the compass were divided into 8 equal parts of 45° each, with north, northeast, east, southeast, south, southwest, west and northwest at the centers of these parts.

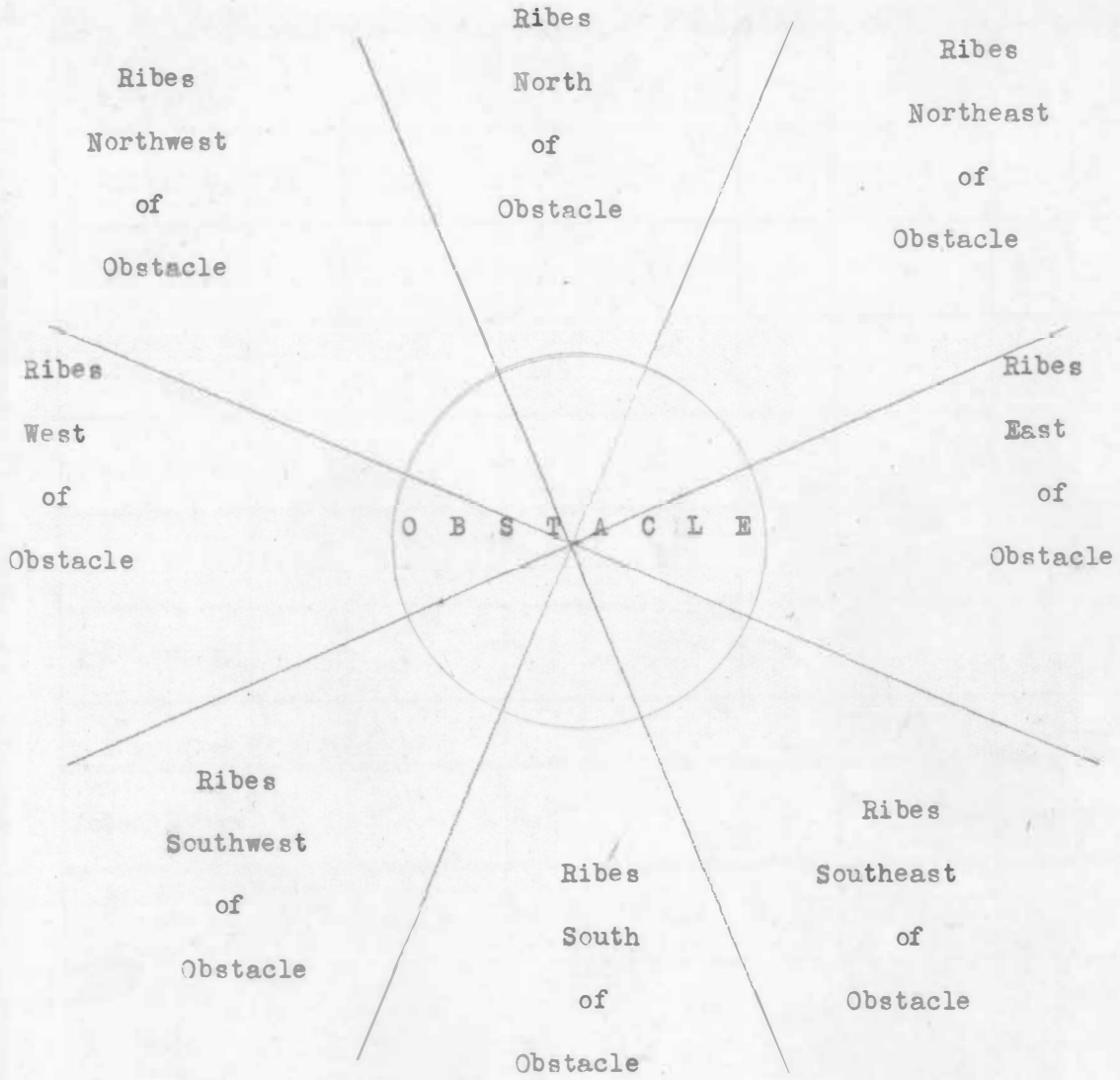
In all, 905 Ribes are listed under this table, altho a few of these, possibly 5 percent, are duplicated, being invisible from two or more directions.

Those bushes which are not hidden from any direction, are listed as visible from all sides, while those which are hidden from all directions, are listed under that heading.

Of the total Ribes tabulated, 331, or 36.5 percent, are visible from all directions. A total of 165, or 18.2 percent, are hidden from all directions. This leaves 45.3 percent of the "missed" bushes as invisible from some of the several specific directions. For example, "not visible from the Southwest" means that the bush is on the northeast side of a shrub or similar obstacle.

These 409 bushes are divided between the 8 stated divisions of the perimeter as follows:

		Percent
Not Visible from North	(On S. side of obstacle)	10.5
" " " Northeast	(" SW. " " ")	4.9
" " " East	(" W. " " ")	19.1
" " " Southeast	(" NW. " " ")	7.3
" " " South	(" N. " " ")	23.0
" " " South	(" NE. " " ")	11.2
" " " West	(" E. " " ")	19.1
" " " Northwest	(" SE. " " ")	4.9
	Total	100.0

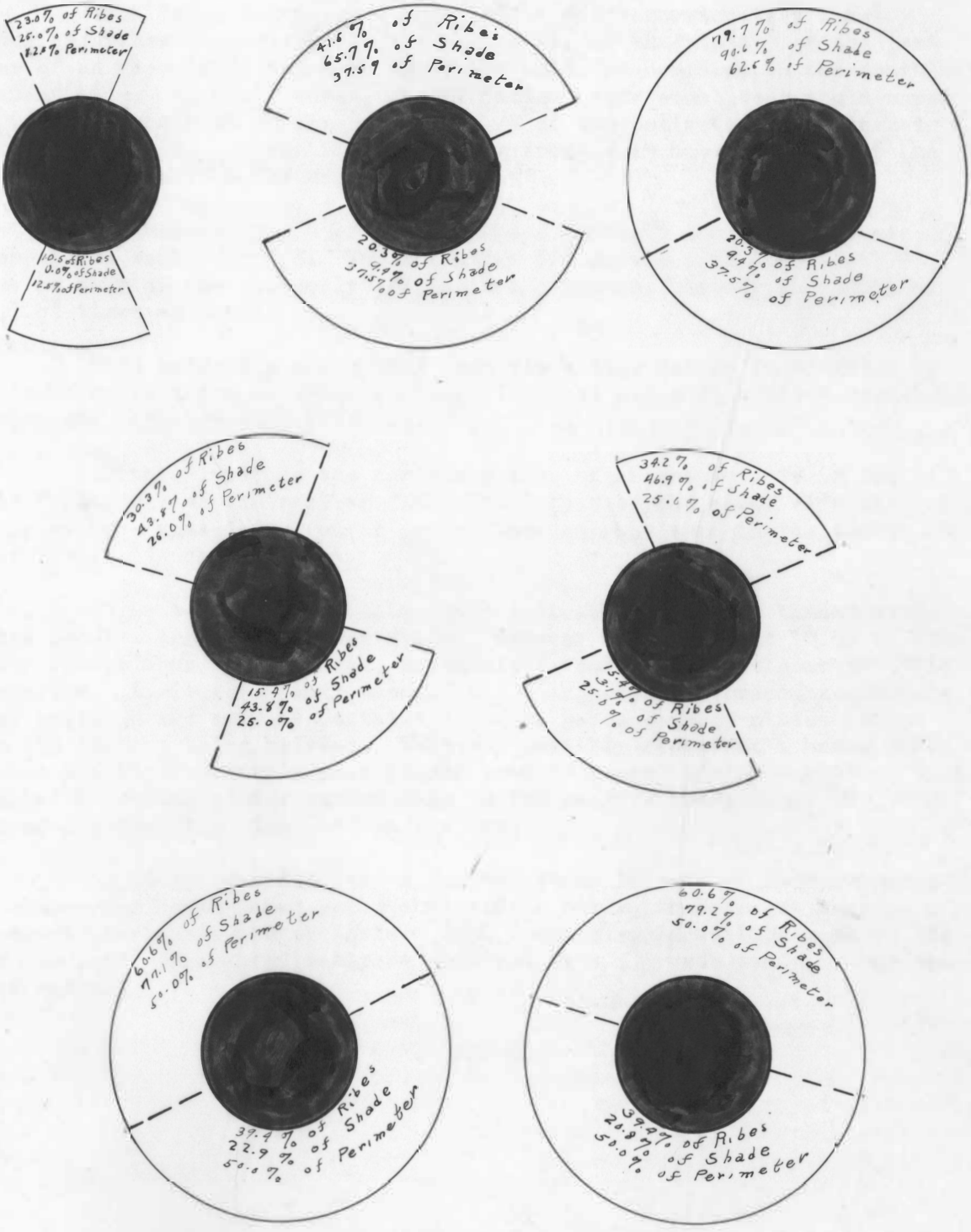


Classification of Direction of Ribes from Obstacle.

Table 57

No. of Hours During Working Day When Each Sector is Shaded by Obstacle

Hour of Day	North	Northeast	East	Southeast	South	Southwest	West	Northwest
8 - 9 A.M.	1	1/3	-	-	-	2/3	1	1
9 -10 A. M.	1	2/3	-	-	-	1/3	1	1
10-11 A. M.	1	1	-	-	-	-	1	1
11-12 A. M.	1	1	1/3	-	-	-	2/3	1
1 - 2 P. M.	1	1	1	-	-	-	-	1
2 - 3 P. M.	1	1	1	1/3	-	-	-	2/3
3 - 4 P. M.	1	1	1	2/3	-	-	-	1/3
4 - 5 P. M.	1	1	1	1	-	-	-	-
Total Hours	8	7	4-1/3	2	-	1	3-2/3	6
% of Total Shade	25	21.9	13.5	6.3	0.0%	3.1%	11.4%	18.8



Diagrams showing distribution by percents of "missed" partially hidden Ribes, and the relation of this percent to shade and to the direction of the obstructing object.

This table and diagram show that a disproportionately large number of bushes were missed on the northerly, or shady side, of the perimeter of an associated shrub or other obstacle, as compared to the southerly, or sunny side. In other words, if all factors were equal, one would expect to find 1 missed bush in the northerly 1/8 of the perimeters to 1 bush in the southerly 1/8. In reality, the check found 2.19 missed bushes in the northerly 1/8 to 1 in the southerly 1/8.

The northerly 3/8 of the perimeter has 2.05 times as many missed Ribes as the southerly 3/8. The northerly 5/8 of the perimeter has 3.93 times as many as the southerly 3/8, although proportionately it should have but 1.67 times as many.

This evidently means that some visibility factor is affected by the location relative to the obstacle. The best and most obvious explanation is that the light is thus affected.

At this latitude the northerly side of an obstacle is in the shade during all of the working day. The bushes on the north side of obstacles were missed in greater number because they were in the shade, and their visibility thus lowered.

It is believed that this study indicates that many bushes were missed because they were in the shade. However the fact that 10.5% of the missed bushes were in the south, or sunniest sector does not bear out this conclusion. It is noted that each of the four sectors representing a cardinal point of the compass contains a larger percentage of missed bushes than the sectors lying between. This may possibly represent a human error in that the observer may unconsciously tend to record a missed bush as in a cardinal direction sector rather than in the sectors between, if the bush is near the dividing line between sectors.

It is recommended that a further study be made of this subject, the chance for human error being obviated by taking the compass bearing of the missed bush from the obstacle. Such a study could well be made on the same area, and might profitably be combined with a growth study of the same Ribes bushes.

Control Reconnaissance

The purpose of control reconnaissance is to make studies, estimates and plans of the methods and costs of local control on forest lands, for the protection of white pine from blister rust.

Control reconnaissance studies have been made on six areas in northeastern Washington, and northern Idaho. These areas are as follows:

1. Upper Priest River Area. The watershed of the Upper Priest River, Idaho, from the Canadian border to a point 2⅔ miles south of the border.

2. Pend Oreille River Area. From the Pend Oreille River to a line averaging 2 miles east of the river, and from the Canadian border south to Metaline Falls, Washington.

3. Sullivan Lake Area. The watershed of a stream flowing northwestward into Sullivan Lake, 8 miles southeast of Metaline Falls.

4. Salmon River Area. A portion of the headwaters of the Salmon River, on the boundary between Idaho and Washington, and along the Canadian border, 17 miles northeast of Metaline Falls.

5. Porthill Area. Portions of the watersheds of Blue Joe, Grass, Saddle, Boundary, Cow, Smith and Canyon Creeks, west and southwest of Porthill, Idaho.

6. St. Joe Area. 43 sections T. 44 N., R. 3 and 4 E., and T. 43 N. and 44 N., R. 6 and 7 E., on the St. Joe National Forest, south of Avery, Idaho.

Areas 1 to 4 were studied by this office; areas 5 and 6 were studied as cooperative projects between this office and the Forest Service.

The methods of work were as follows: strips one rod wide were run usually transverse to the watersheds and one fourth mile apart. The several factors, such as number of Ribes, amount of white pine, brush cover, windfall, topography, etc., affecting local control were tabulated on these one rod strips. The area adjoining the Pend Oreille River was covered with strips one mile apart, and less detailed notes were made. In recording this information, the strips were divided into transects, each transect one chain in length, and separate records were kept for each transect.

On area 5 and area 6, the work consisted of a series of quarter acre plots, instead of strips, Occasional plots with actual Ribes counts were made, supplemented by numerous plots with estimates of the number of Ribes. Detailed information on these two areas will not be available until worked out in cooperation with the Forest Service.

CONTROL RECONNAISSANCE

Date 192-- Course Degrees

	Brush: Dominant Species	Ht.	Den.	Rock	T. R. Sec. Topography	Altitude	Notes

CONTROL RECONNAISSANCE

WATERSHED STRIP NO. RECORDER

R. lacustre				R. viscoss				G. inerm.								Time	Visibl.	White Pine					
																		Mature	Poles		Repro.		
1	10	50	Up	1	10	50	Up	1	10	50	Up	1	10	50	Up.			D. B. H. & No. Logs	No.	Av. Age	No.	Av. Age	

At the close of the field season, the data collected on the reconnaissance work were analyzed in relation to their positive and negative value as factors in local control costs. In order to do this, it was necessary to at least tentatively plan the actual organization of such local control work.

Experimental local control which has been carried on in the West during the past two field seasons, has been organized entirely on the basis of eastern methods. That is, each area has been divided into the portion to be worked by crews, and that to be covered by very extensive scout methods. It is the present opinion of the western blister rust personnel that this method, despite its undoubted value in the East, is not applicable to western forest conditions. This opinion is based upon the following reasons:

1. The recheck of the experimental local control project at Elk River, Idaho, showed the maximum efficiency, by number of bushes, to be lower on advance scouting work than the minimum efficiency on crew work.

2. Difficulty of location. A man working alone on advance scouting must either have well-defined landmarks almost constantly in sight or he must drop paper trail, if he is to cover the area assigned to him with necessary thoroughness. Under conditions existing in the western forests, where such work is carried on, no suitable landmarks exist. In many cases there are no roads, and relatively few trails. That part of any project area which would normally be assigned to an advance scout generally consists of several thousand acres of forest land, seldom marked out by any definite boundaries, and usually of such rough topography that a comprehensive view of the entire piece of ground is impossible. Under such circumstances, the scout can only keep his relative location and be sure of covering all the ground by dropping paper trail. The use of paper trail by one man is inefficient. His width of strip is necessarily decreased to a point at which he can see the paper. Also, his attention is distracted from looking for Ribes because he must watch his paper trail.

For these reasons, it is considered advisable to cover any area entirely by crew. The method recommended might be termed an elastic crew formation. Under conditions of low visibility, high Ribes concentration, etc., a narrow spacing between men will be used. Where visibility is high, and Ribes are few, the spacing will be greatly widened and the pace increased. In such places it may be feasible to put the foreman in line, probably at the center. On considerable portions of the Upper Priest River Area, it is estimated that a crew can cover a strip 500 feet wide.

The estimates of cost of local control, given below for the several areas studied, are based upon such a method.

Such estimates are based upon two factors: (1) the cost per day of a crew, as determined by rate of pay, subsistence, and accessibility of area influencing cost of transportation of men and supplies, and (2) the area which a crew can cover per day in local control work. Control reconnaissance deter-

mines the working factors influencing the possible acreage to be covered per day, thus making estimates and detailed plans possible. These working factors, when interpreted in the light of previous experience in experimental local control, will determine (1) the width of strip which a 6-man crew can efficiently cover, and (2) the length of such a strip that can be covered by a crew in a day. The factors which are considered as influencing this width and length of strip, in order of relative importance are:

Brush - density, height, species.
Reproduction - age, density, species.
Herbaceous growth - density, height, species.
Topography - rocks, roughness, steepness.
Ribes - size, species, abundance, concentration.
Windfall - density, height.

The following analysis of these factors is based upon the actual results of the reconnaissance work:

Brush. The brush factor is taken in terms of (1) density, (2) height, and (3) species.

The density of brush cover represents the actual proportion of ground that is covered, or shaded, by the brush, expressed by a scale of 0 (open) to 10 (maximum or total cover). The density of this cover includes not only shrubs but the larger herbaceous growth as well. Brush density directly influences both width and length of strip. It is an important factor in visibility, hence it influences width of strip. It has an important bearing on the speed at which crew men can move forward without having their attention diverted from the constant search for Ribes, hence it influences length of strip.

The height of brush is the field man's estimate of the average brush height on the transect. Plants such as Alnus and Salix, when of considerable height and open beneath, are not considered as brush. The height of brush affects both width and length of strip. Width of strip is influenced in that visibility is influenced. A dense brush cover of fairly uniform height will greatly decrease the visibility of Ribes of the same or lower height, but will only slightly decrease the visibility of taller Ribes. The length of strip is influenced, as in the case of density, by difficulty of motion.

The species of brush was taken as accurately as possible. In reality, in most cases, this means genus and not species. This factor will influence both width and length of strip. Visibility, hence width of strip, is closely dependent upon species of brush in relation to species of Ribes. Certain brush species very materially decrease the visibility of certain Ribes species. For example the visibility of R. viscosissimum is greatly lowered when it grows in association with Ceanothus velutinus, but when associated with Salix spp. and Amelanchier florida it is much more readily visible. Difficulty of motion, hence length of strip, is often dependent upon species of brush. Certain species, such as Ceanothus velutinus, are extremely stiff and difficult to walk through, while others, such as Vaccinium spp. offer little impediment to progress.

In the foregoing discussion the three phases of the brush factor have been considered separately. In reality, they are interdependent to a great degree; particularly, density and height are dependent upon species. The importance of the brush factor in cost of local control, and the relation of Ribes to associated brush species, can profitably form the basis of further intensive study.

Reproduction. By this term is meant only the coniferous reproduction on the area. When considered as a cost factor in local control, the term reproduction does not necessarily refer to young trees of any definite age-class, height, or D.B.H. - class. It really refers to any group of immature trees which affect visibility and speed of progress, either because of foliage growing close to the ground or because of number on a given area.

Reproduction has direct bearing on visibility, in that it may actually screen the Ribes from view. Such an effect is more apt to occur either in young or in fairly sparse reproduction than in older or very dense growth. This is due to the fact that only very young trees or older ones occurring in sparse formation are apt to have foliage near the ground. In these cases, the length of strip is very little affected, as these types of growth do not retard progress to any appreciable extent.

Very dense reproduction, especially when taller than a man, has a greater effect on the length than on the width of strip. Due to the fact that natural pruning has generally killed the lower limbs in this dense growth, visibility is not greatly decreased by its presence on an area. Also, brush is relatively sparse or entirely absent in this type of growth. The impenetrability of, and consequent difficulty of movement, in dense growths of reproduction, however, bear importantly on the length of strip.

The reproduction factor may be briefly summarized as follows: when young and sparse, it acts similarly to brush in decreasing visibility. When the growth is dense and the lower foliage is taller than a man's head, it decreases length of strip, because it constitutes a serious impediment to progress.

Herbaceous growth: Under forest conditions, herbaceous growth will be of sufficient height and density to affect local control work only on local areas. Such areas will generally occur only in moist situations such as stream banks, alluvial bottoms, or springy places. In these locations herbaceous growth may be present to a sufficient height and density to affect visibility. Its effect under these conditions is closely comparable to that of brush in affecting width of strip.

By impeding progress, herbaceous growth may affect length of strip. Its effect in this regard, however, is much slighter than that of brush.

In general, herbaceous growth may be considered as a local control factor of only minor importance, because of its localized occurrence on white pine areas.

Topography. This is undoubtedly the most complex of all local control factors, in reality, topography has a two-fold effect upon local control. First, such topographical factors as degree of slope, direction of slope, presence or absence of small draws, watercourses, rock ledges, outcrops, slides or fields (areas of broken or fragmented rock) will affect the local flora, and thus affect such other factors as brush, reproduction, herbaceous growth and Ribes. Secondly, all these topographical factors are of prime importance in determining the physical difficulty involved in actually working the area, packing in supplies, establishing suitable camps, and the time lost in walking between camp and work.

Degree of slope is of more importance in regard to difficulty of working an area than as affecting other factors. While actual local control work will be so planned that the men will walk parallel to the contours where possible, and not across them, very steep slopes will nevertheless prove more difficult walking, and will thus tend to distract attention and slow up the pace. The effect of steepness of slope on visibility requires further study.

Direction of slope is universally recognized as an important ecological factor, and is thus of considerable importance in determining the presence, density, and constitution of the brush, reproduction, herbaceous growth and Ribes,

Small draws and watercourses which are encountered by control crews will be crossed at right angles to their courses, if the crews are following contours. They will tend to contain more brush, herbaceous growth and Ribes than the intervening ridges, and if numerous will thus tend to shorten the length of strip. Large streams will seldom be crossed by control crews, in working formation. The first few strips paralleling such streams will possibly contain considerable herbaceous growth. Ribes may or may not be abundant in these strips. They were very numerous at Priest River Experiment Station and very few in Upper Priest River.

Rock ledges, outcrops, slides or fields will chiefly influence difficulty of progress and number of Ribes. In many cases it has been found that rock, particularly in the form of ledge, is accompanied by surface water, giving rise to a dense growth of Ribes. Also R. lacustre has often been found to occur in considerable profusion in rock slides.

In addition to the larger topographical features enumerated above, there are numerous small, local variations, each representing a causative factor in the occurrence of highly localized special conditions. Among these minor variations are "upturns" (piles of dirt resulting from a tree or stump falling over) hummocky areas, and isolated large boulders. Such conditions affect Ribes growth as well as speed of progress.

Ribes. The importance of the Ribes factor on a given area is dependent upon several secondary factors, as follows: number on area, degree of concentration, size of bushes, and species.

The actual number of Ribes on the area will, of course, exert an important influence on the local control cost. Unless this number is very great, however, it should not be given too much weight. That is, if one area contains

10 bushes per acre, and another 25 per acre, the cost will be influenced more by other factors, such as brush, topography, reproduction, etc. In other words, it would seem impractical to compare local control costs on two areas on the basis of relative cost per pulled bush. Factors other than number of Ribes will exert too great an influence to make such figures relevant.

The degree of concentration of the Ribes on an area is a factor which will undoubtedly prove of great importance after further careful study. The areas on which intensive reconnaissance studies have been made to date show that concentration of Ribes generally occurs. On the Upper Priest River area, 83% of the Ribes occur on only 6.3% of the area. The lowest degree of concentration was found on the Salmon River area, where 98% of the Ribes occurred on 50% of the area. While no studies have been made on areas where at least this degree of concentration did not exist, general observation leads to the belief that the lowest concentration will occur on areas of quite young reproduction, 0 to 10 years old, where light conditions are more uniform. Sufficient data are not as yet available to show what is the effect of this concentration on costs.

Size of Ribes bushes will influence two other factors - actual pulling time and visibility. On small bushes the actual pulling time is so small as to be almost negligible, but the searching time will be increased. If small bushes are very numerous or if an effort is made to find all small bushes, the searching time will be increased and hence the length of strip decreased. Visibility is partially determined by the size of Ribes bushes. A brush cover of a given average height might affect the visibility of bushes 3 ft. high to only a very limited degree, but might entirely screen bushes 1 ft. high.

Species of Ribes will affect pulling time and visibility. With the limited data at hand, it would seem that there is considerable difference in the difficulty of pulling various species. R. viscosissimum and R. sanguineum are known to be more difficult to pull than R. lacustre. Difficulty of pulling because of growth habit will probably prove to be an important factor in the case of R. petiolare.

The relation of Ribes species to visibility has been discussed under the brush factor.

Windfall. The density or amount of windfall has a direct relation to both the width and length of strip. It decreases the speed with which an area can be covered, and lowers the visibility.

The height of windfall may also affect both the width and length of strip, by retarding rate of progress, and decreasing the visibility.

The importance of windfall is increased by its combination with one or more of the other chief factors, such as brush, reproduction, or topography.

The following detailed discussions of the four areas will show the existing conditions. Extimates on the cost of local control are also included.

Reconnaissance Area No. 1. Upper Priest River

Location. The watershed of the Upper Priest River, Idaho, from the Canadian border to a point 2½ miles south of the border.

Area. 2310 acres.

Topography. A steep sloped valley, branching at about the center of the area. Upper Priest River flows southward from the border to its junction with the East Fork, and then turns southwest. East Fork flows in a general westerly direction to this junction. Approximately ½ mile north of the junction, Priest River forms a waterfall about 50 feet high. Above this point are numerous cascades and falls. The west slope leading down to Priest River north of the junction is precipitous south of this waterfall, (not included in area) and less steep but very rocky north of the waterfall. The east slope is quite steep but fairly smooth south of the waterfall and steeper and more rocky north of the waterfall. The north slopes leading down to East Fork are fairly steep but smooth. The south slope consists of a series of ledges and short slopes. The headwaters of the south fork of East Fork are characterized by numerous moist, springy areas. The southeast and northwest slopes south of the junction of Priest River and East Fork are less steep, than above the junction, and are quite smooth. Except in the precipitous places, the slopes on the area average from 50% to 70% in steepness. The valley bottom, below the junction, is approximately ¼ of a mile wide. Although the altitudinal topographical range of the valley ranges from 3500 ft. to 7000 ft. the area covered by reconnaissance usually ranges from 3500 ft. to 5500 ft. The higher slopes were not included, as they represented only subalpine conditions.

Timber stand. The area is generally covered by a mature stand of timber. The valley bottom is occupied by the cedar-hemlock type, mature or over-mature. It consists chiefly of cedar and hemlock with scattered mature white pines. From the valley bottom up to about 5500 ft. the white pine type predominates. This consists dominantly of a mature stand of mixed species in the following relative order of abundance; hemlock, white pine, cedar, white fir. The white pine is generally most numerous and important on the middle and lower slopes. From 5000 to 5500 ft. it thins out, finally giving way to the subalpine belt, characterized by Abies lasiocarpa, Pinus albicaulis, Picea engelmanni, and occasional Juniperus communis.

In the area covered by reconnaissance, the white pine averages 15,105 bd. ft. per acre, being from 20-25% of the total stand. 82.5% of the merchantable white pine is 14" or more D.B.H.

Reproduction. The area is characterized by relatively sparse reproduction. By species, the relative abundance of reproduction is probably hemlock, cedar, white pine, white fir, spruce, and Douglas fir.

The white pine reproduction over the area averages 2-3/4 poles and 10-1/3 seedlings per acre. In all openings where reproduction has had any chance, white pine is abundant. In the few limited areas of reproduction stands, white pine averages from 20 to 30 percent of the young growth.

Ribes. The Ribes on this area consist of R. lacustre 93% and R. viscosissimum 7%. The bushes are of small average size. The total of all bushes on the strips in

this area, were of the following percentages in live-stem classes:

Live-stem class	% of bushes.
1 Ft. and under	15.7%
1 Ft. to 10 Ft.	47.8%
10 Ft. to 50 Ft.	30.6%
Over 50 ft.	6.3%

The Ribes on the area are mostly concentrated within very limited areas, occurring above the falls on Upper Priest River, and around the headwaters of East Fork. Of a total of 909 1 chain transects run, 749, or 82.4%, showed no Ribes, The Ribes are mostly in burns, seepage areas, draws, or at the bases of rock ledges. 6.3% of the area or 145.5 acres, contains 83% of the Ribes, or at the rate of 490 bushes per acre. 93.7% of the area, or 2164.5 acres, contains 17% of the Ribes, or at the rate of 6.8 bushes per acre. A small burned area on East Fork, consisting of about 54 acres, contains 37.9% of all the Ribes on the entire area, or approximately 604 per acre.

Summarized, the Ribes factor is briefly as follows: two species R. lacustre and R. viscosissimum occur on the area, and are mostly concentrated on limited areas. The several spots of high Ribes concentration will require very intensive work. The balance of the area can be worked extensively. In general, Ribes are less common on those parts of the area supporting the best mature white pine. The subalpine region, altitudinally above the white pine, contains numerous Ribes.

Factors favoring local control.

1. Brush is usually sparse or entirely lacking. It is less brushy than any other large area encountered. A large part of this area is entirely brush free. Most of the brush is along the streams, in the burns, and along the upper altitudinal limits of the area.

2. The sparseness or the complete absence of reproduction over most of the area, and its concentration in a few limited areas, tends to favor crew work.

3. Herbaceous growth is generally of small size and of sparse occurrence. Where it does attain considerable size, generally on bottoms along streams, it is frequently so dense as to prevent the growth of any Ribes. The greater part of the area is entirely free from herbaceous cover.

4. Almost half of the Ribes within the area are in a single tract of from 50 to 75 acres. Another 5 acre burned area has over 400 Ribes per acre. Intensive crew work will prove necessary only on about 5 percent of the entire tract. The remainder of the area can be covered with a very extended crew formation.

5. The area is relatively free of windfall. There are no extensive areas of heavy windfall within the area covered. Scattered local patches of heavy windfall occur, but seldom as extensive as a single acre.

Factors adversely affecting local control.

The topography is steep and rugged, with abundant rock outcrops, ledges, slides, rock fields, and difficultly traversed slopes. The several topographic factors render more difficult the eradication problem.

Estimated cost of local control.

In computing the cost of local control, estimates on the length and the width of a crew's average strip per day have been made.

The estimated length of strip is an average of every condition which obtains within the block, and presents the estimate on the crew's capacity. It necessarily includes portions of the block which must be worked more slowly, and other portions which will be done more rapidly. It is based on our past experience and observations as to the rate of progress of a crew, as applied to the conditions here.

The width of strip is based entirely on the results of the reconnaissance data of the past season. It is the compiled average visibility over the entire area. This average crew width is based on a 5 man crew carrying a strip 8½ times the visibility. This permits the two outside men of the crew to carry narrower strips, on account of their dropping and following the paper trail.

Under conditions existing on area a crew should cover a strip 98 feet wide and 2 miles long, or 23.76 acres per day. Daily cost of crew - $31.60. Cost per acre - $1.33.

The white pine on this area is conservatively estimated to have a value of at least $6 per thousand board feet standing. The eradication of Ribes from this tract is estimated to cost approximately 1½ percent of the pine value represented, or about $.09 per thousand board feet.

Reconnaissance Area No. 2 Pend Oreille River Area

Location. A north and south strip with an average width of two miles from the Canadian boundary to Metaline Falls, Washington, lying east of and adjacent to the Pend Oreille River.

Area. 16,000 acres.

Topography. A flat to gently sloping and rolling bench and westerly slope, along the east side of the Pend Oreille River. The altitude of the area ranges from 1700 feet to 3500 feet, tho the greater part has an elevation of about 2500 feet. The relief of the area is increased by numerous dissecting canyons and draws, usually draining westward toward the river. This bench breaks away on the westerly edge of the area to the canyon of the Pend Oreille River. Local areas of more rugged character, generally spurs of the mountains on the east, extend into the area. The topography of the area is typically that of a limestone region, consisting chiefly of flats and irregular breaks. It does not have the uniform slopes which usually prevail in this region.

Timber Stand. The area has very little merchantable timber. It is generally covered by a dense reproduction thicket of mixed species. Mature larch, Douglas fir, cedar, white pine and lodgepole pine, the order indicating their relative abundance, occur in scattered clumps or as individual trees. The merchantable white pine averages 737 board feet per acre for the entire area. 70% of these merchantable trees are from 8" to 12" D. B.H.

The merchantable timber occurs chiefly in the valleys or canyons, where the mature growth has not been entirely destroyed by fire, and usually scatteringly elsewhere.

The white pine is generally distributed on all except the exposed southerly slopes. These slopes usually support a yellow pine - Douglas fir stand. The white pine is most abundant on most of the northerly and northeasterly slopes, and on some of the flats.

Reproduction. The greater part of this area is characterized by dense reproduction thickets. By species the relative abundance is probably Douglas fir, larch, lodgepole pine, white pine, hemlock, and cedar respectively. The reproduction stand over the entire area is 20.3 poles and 57.1 saplings, or 77.4 per acre.

Although the records show but about 6 percent of the coniferous growth as white pine it is believed this species will probably comprise 15 or more percent of the ultimate stand.

The white pine reproduction is quite uniformly distributed over the area covered, except on the exposed southerly slopes and ridges. It is most abundant, however, on the cooler sites.

Ribes. The Ribes on this area consist of R. lacustre 62.5%, and R. viscosissimum, 37.5%. The total of all bushes on the strips in this area, were of the following percentages in live-stem classes:

Live-stem Class	% of Bushes.
1 Ft. and under	32.3%
1.1 Ft. to 10 Ft	47.4%
10.1 Ft. to 50 Ft	19.5%
Over 50 Ft	0.8%

The Ribes on the area are mostly concentrated within very limited areas. Such areas found were mostly associated with relatively open merchantable stands, where the soil moisture is noticeably more than average. Of a total of 1163 transects run, 1084, or 93.2% showed no Ribes. 1.1% of the area, or 176 acres, contains 49.06% of the Ribes, or at the rate of 574 per acre. 98.9% of the area, or 15824 acres, contains 50.94% of the Ribes, or 6.68 bushes per acre.

Summarized, the Ribes factor is briefly as follows: Two species R. lacustre and R. viscosissimum occur on the area, and are mostly concentrated on very limited areas. These several spots of high Ribes concentration will require very intensive work. The balance of the area can be worked extensively. Most of the scattered Ribes are in process of being shaded out, while with the Ribes in areas of high concentration this is not apparent.

Factors favoring local control.

1. Brush is usually sparse or entirely lacking. Most of the Ribes occur in the scattered or local bushy areas. Most of the brush is usually found in local seepage spots.

2. The topography of probably from 70 to 90% of this area is either level or gently sloping, with very few precipitous slopes or difficultly accessible areas. The steeper slopes which are within the area are mostly readily covered by an eradication crew.

3. Herbaceous growth is generally of small size and of minor importance. It generally attains greater size in the areas of high Ribes concentration than elsewhere. It is not an especially retarding factor in considering the eradication of this area. Some small herbaceous growth is quite general over the area except on the dry exposed southerly slopes.

4. Almost half of the Ribes within the area are within 1% of the area, and all of the Ribes are in 6.8% of the area. Intensive crew work will be necessary only on about 1% of the entire tract. The remaining 99% of the area can be worked with a more or less extended crew formation.

5. This area is readily accessible by a road from Metaline Falls to the Canadian line. The area itself is parallel to and on both sides of this road.

Factors adversely affecting local control.

1. The general extent of dense reproduction thickets over the greater portion of this area is a serious problem in the eradication of this tract. The physical difficulty and discomfort of fighting one's way through this type of growth will prove a serious deterrent factor. Very wide spacing over such of this area will be impossible. The visibility here will very nearly control the spacing between men because there appears to be no extensive area here which is Ribes free.

2. Altho the area as a whole does not show a prohibitive windfall factor, there are many local areas of heavy windfall where this factor is very important.

Estimated Cost of Local Control.

In computing the cost of local control, estimates on the length and the width of crew's average strip per day, have been made. The estimated length of strip is an average of every condition which obtains within the block, and presents the estimate on the crew's capacity. It necessarily includes

portions which must be worked more slowly, and other portions which will be done more rapidly. It is based on our past experience and observations as to the rate of progress of a crew, as applies to the conditions here.

Under conditions existing on this area, a crew should cover a strip 86 ft. wide by 1¾ miles long, or 18.21 acres per day. Since the estimated daily crew cost is $31.60, the cost of local control on this area is $1.73 per acre.

Local control on this area must be charged against the potential crop of white pine, since the greater portion of the tract supports only a reproduction stand.

Reconnaissance Area No. 3. Sullivan Lake Area.

Location: The watershed of a small unnamed stream flowing northwestward into the northeast corner of Sullivan Lake, 6 miles southeast of Metaline Falls, Washington.

Area: 615 acres.

Topography: A steep sloped narrow valley, draining northwestward from the amphitheater or modified cirque, in which it rises, to Sullivan Lake. Except for the several springs which join at or near the headwaters, the stream has no tributaries. Throughout its course, the stream gradient averages about 1000 feet per mile. Small falls and cascades are common throughout its length. The altitude rises from 2700 feet at Sullivan Lake to about 5700 feet at the head of the valley.

The southwest side (northeasterly slope) of the valley rises steeply and steadily to an average of 800 feet above the stream. This slope ranges from 25 to 75 percent, with an average gradient of about 40 percent. It is characterized by many small ledges and outcrops.

The north side (southwesterly and southerly slope) of the valley presents a much more accessible slope. Its rise from the stream to the drainage divide ranges from about 25 feet to as much as 500 feet. This side of the valley has a range in slope of from 5 to 60 percent, with an average slope of from 20 to 25 percent. This slope is more uniform and less rocky than the opposite slope. Ledges and outcrops are not common. The cross-section valley profile is V-shaped, having no alluvial bottom.

Timber Stand: Most of the area is covered by a mixed stand of all ages. The basal slopes are dominantly cedar-hemlock type with Douglas fir type (easterly slope) and lodgepole pine type (westerly slope) dominant on the middle and upper slopes.

For the entire area the relative abundance of the several species is probably Douglas fir, lodgepole pine, hemlock, cedar, white pine, and larch. White pine is scattered through these stands on the middle and lower slopes.

In the upper portion of the watershed, Abies lasiocarpa, Picea engelmanni, and Pinus albicaulis are the important species, but this condition is above potential white pine lands.

About 100 acres of the east side of the valley (westerly slope) near the headwaters is a burn probably 20 years of age. Occasional mature trees within this area are still alive, some of the dead are still standing, but most of the old stand have fallen. Dense reproduction thickets cover the greater portion of this area, rendering travel exceedingly difficult.

In the area covered by reconnaissance, the white pine averages 1003 bd. ft. per acre, of which 47% is from 8" to 12" D. B. H.

Reproduction: The greater part of the area is characterized by moderately abundant reproduction. It is noticeably more sparse on the exposed westerly and southerly slopes. By species, the relative abundance of reproduction is probably Douglas fir, lodgepole pine, hemlock, white pine, and cedar.

The white pine reproduction over the area averages 6.1 poles and 219.3 saplings per acre. The heaviest white pine reproduction within the area is in the lower levels of the 100 acre burn. The upper levels of this burn are of subalpine character. The white pine reproduction is generally increasingly abundant from the drainage divide to the slopes immediately adjoining the stream.

Ribes: The Ribes on this area consist of R. lacustre 69.9%, and R. viscosissimum 30.1%. The bushes are of medium average size. The total of all bushes on the strips in this area were of the following percentages in live-stem classes:

Live-stem Class	% of Bushes
1 ft. and under	29.0%
1.1 ft. to 10 ft.	33.1%
10.1 ft. to 50 ft.	18.6%
Over 50 ft.	19.3%

The Ribes on the area are mostly concentrated within limited areas, throughout the amphitheater or cirque at the head of the valley, and a strip across the valley one-fourth mile above the mouth. Of a total of 281 one chain transects, run 172, or 61.2% showed no Ribes. The Ribes are mostly in (1) a burned area, (2) the subalpine amphitheater at the headwaters, (3) a northerly slope with many ledges, and (4) an alluvial flat ¼ mile northeast from the mouth of the creek. 26.7% of the area, or 164.2 acres, contains 96.6% of the Ribes, or 537 bushes per acre. 73.3% of the area contains 3.4% of the Ribes, or 6.9 bushes per acre.

Summarized, the Ribes factor is briefly as follows: Two species, R. lacustre and R. viscosissimum occur on the area, and are mostly concentrated on ¼ of the area. These several spots of heavy Ribes will require very intensive work. The remainder of the watershed can be worked extensively. The subalpine area in the headwaters of the valley, is characterized by high Ribes concentration.

Factors favoring local control:

1. Brush is generally sparse or entirely lacking. It has less brush than any other area covered. A considerable part of the area is entirely brush free. Most of the brush encountered is at the higher altitudes, at the headwaters of the stream.

2. Herbaceous growth is usually of small size and of rather limited occurrence. In the headwaters, however, a heavier growth of herbaceous plants is common.

Factors adversely affecting local control:

1. Dense, highly empenetrable reproduction thickets cover about 20% of the area, some parts of these thickets are not especially difficult to cover, while other portions present almost impenetrable conditions.

2. The topography of the area consists for the most part of steep slopes, with numerous rock outcrops and ledges to add to the other difficulties.

3. Most of the Ribes in the area occur in those parts of the watershed where crew work is most difficult. The highest Ribes concentration is on the burned area in the upper part of the valley, where the reproduction thickets are highly impenetrable. Many of the Ribes bushes are interwined with criss-crossed down logs and with dense reproduction thickets. The remaining portion of the headwaters amphitheater also has a high Ribes concentration. Many of the other Ribes bushes occur on ledges and outcrops of rather difficult accessibility.

4. Heavy criss-crossed windfalls, often to a depth of several feet, cover the ground over a considerable portion of the burn in the upper part of the valley. Here we have a concentration of several difficulties into a single area; namely (1) heavy criss-crossed windfall, (2) in a dense reproduction thicket, (3) on very steep slopes, and (4) with many Ribes bushes. This combination of adverse factors will unite to cause very high crew costs over this acreage.

Windfall over the balance of the area is not a dominant factor, the local areas of heavy windfall occur in all parts of the valley.

Estimated Cost of Local Control:

Under conditions existing on this area, a crew should cover a strip 95 feet wide and 1½ mile long, or 17.31 acres, per day. The daily cost of a crew is figured at $31.60, giving a cost of $1.83 per acre for local control over the entire project.

The mature white pine on this area is not present in sufficient quantities to permit charging local control against the present merchantable white pine, and the cost must necessarily be assessed against the potential white pine crop.

Control Reconnaissance Area No. 4, Salmon River Area

Location: In the extreme northeastern corner of Washington and the northwestern corner of Idaho.

Area: 1800 acres.

Topography: The headwaters of the Salmon River, converging from the north, the east, the south, and the southwest, thence draining northwestward. The several forks consist of steep-sloped valleys, opening into a small flat at the main juction of the several tributaries. The several slopes of these various valleys are more or less similar, except that the branch from the south has a considerable area of alluvial deposits. The other forks do not have such areas. The stream gradients are high to very high, with numerous cascades and falls in all of the forks. The altitude ranges from about 4000 feet at the junction to about 6500 on the divides. Most of the area ranges from 4500 to 5500 feet.

The slopes are quite uniform with very little rock exposure except on or near the ridges. The lower slopes are almost entirely soil-covered. Ledges and outcrops are not common. Except in the few precipitous areas, the slopes range from 20 to 70% in gradient, with an average slope of 40 to 45%.

Timber Stand: The area is covered by a slow-growing high-altitude stand of mature to over-mature timber. It consists of mixed species in the following relative order of abundance; white fir, spruce, white pine, cedar, hemlock, Douglas fir, lodgepole pine and white-bark pine. The white pine is most abundant in a horizontal belt along the middle of the valleyside, being common below 5000 feet elevation and thinning away to zero at about 5500 feet. Above this elevation the timber is subalpine in character.

In the area covered by reconnaissance the white pine averages 5900 bd. feet per acre, and makes up about 15 percent of the total stand. 77% of the merchantable white pine is 14" or more D. B. H.

Reproduction: The area is characterized by a sparse, heavily suppressed reproduction stand. By species, the relative abundance is probably white fir, spruce, cedar, hemlock, white pine, Douglas fir, lodgepole pine, and white-bark pine. The reproduction stand is dominantly white fir, spruce, cedar and hemlock.

The white pine reproduction stand over the area averages 2.4 poles and 16.9 seedlings per acre. Most of this white pine reproduction consists of suppressed individuals. A large percentage of these individuals are from 75 to 150 years of age.

Ribes: The Ribes on this area consist of R. lacustre 99.9%, and R. viscosissimum 0.1%. The bushes are of medium average size. The total of all bushes on the strips in this area, were of the following percentages in live-stem classes:

Live-stem Class	% of Bushes.
1 Ft. and under	13.7%
1.1 Ft. to 10 Ft.	36.7%
10.1 Ft. to 50 Ft.	37.6%
Over 50 Ft.	12.0%

The Ribes on the area are rather generally distributed, no part of the area being Ribes-free. The middle slopes, which support the best white pine growth, have fewer Ribes bushes than any other part of the area. Of a total of 761 one chain transects run, 323, or 42.5%, showed no Ribes. 49.3% of the area, or 887.4 acres, contains 98.6% of the Ribes, or 467.6 bushes per acre. 50.7% of the area, or 912.6 acres, contains 1.4% of the Ribes, or 6.53 bushes per acre. These figures do not mean that any considerable continuous area or block is without Ribes.

Summarized, the Ribes factor is briefly as follows: two species, R. lacustre and R. viscosissimum occur on the area, the latter only occasionally. Most of this area will require very intensive crew work, and the areas of few or no Ribes are so intermingled with the areas of many Ribes bushes that almost all of the area will require intensive crew work. In general Ribes are least abundant on those parts of the area which support the best white pine.

Factors Favoring local Control:

1. The reproduction stand is relatively open over most of this area.

Factors Adversely Affecting Local Control:

1. Dense, luxuriant, high underbrush is common over almost all of this area. The individual bushes average so large and so close together as to considerably impede progress. This heavy growth gives a very low visibility over a considerable part of the area. The brush has an average height of more than 3 feet. The brush is quite uniformly distributed except in those areas of heaviest timber growth.

2. This area is characterized by a rather heavy and luxuriant growth of herbaceous plants, usually in association with the areas of heaviest brush.

3. Steep slopes prevail over almost the entire area. Outcrops and ledges are common only on the higher slopes and ridges. The slopes are generally quite uniform.

4. Heavy windfall is common over a considerable portion of this area. More or less windfall is common to all portions of the tract, and these windfalls on the prevailing steep slopes cause difficult travel.

Estimated Cost of Local Control:

Under conditions existing on the area a crew should cover an average strip 76 feet wide by 1 mile long, or 9.17 acres per day. The daily cost of a crew is figured at $31.60. The resultant cost per acre is $3.45.

The white pine on this area has a value, at $6. per thousand standing board feet, of $63,720. The eradication of Ribes from this tract is estimated to cost $6,210. or approximately 10 percent of the pine value represented. Based on these figures, eradication will cost $.60 per thousand board feet of white pine.

Tabulations

Tables, 58, 59, 60, 61, 62, 63 with Figures 1-2 and 3 given below constitues analysis of Ribes, white pine, and visibility conditions on the reconnaissance areas. The following conclusions are evident from these tables.

Table 59. The average visibility is considerably lower on the transects with Ribes than on the transects without Ribes.

More of the transects with Ribes are in the 8 feet visibility class than in any other class. More of the transects without Ribes are in the 10 feet visibility class than in any other.

88.30% of the transects with Ribes have a visibility of 12 feet or less: 75.77% of the transects without Ribes have a visibility of 12 feet or less.

98.28% of the transects with Ribes have a visibility of 16 feet or less; 91.38% of the transects without Ribes have a visibility of 16 feet or less.

1.72% of the transects with Ribes have a visibility of more than 16 feet; 8.62% of the transects without Ribes have a visibility of more than 16 feet.

Table No. 60. This table indicates that 45.78%, or almost one-half of the Ribes, occurs in those portions of the region having a visibility of 6 feet or less; 70.45% of the Ribes are in those parts of the region having a visibility of 8 feet or less; 87.88% or 7/8, of the Ribes bushes are on those portions of the region having a visibility of 10 feet or less; 95.34% of the Ribes occur in areas having a visibility of 12 feet or less; 97.90% of all Ribes occur on areas having visibility of 14 feet or less; and 99.45% of all Ribes occur in those parts of the region having a visibility of 16 feet or less.

This table indicates that 91.9% of the Ribes bushes of the region covered are R. lacustre and 8.1% of the bushes are R. viscosissimum.

The average visibility where R. lacustre occurs is 7.60 feet, the average where R. viscosissimum occurs is 9.32 feet, and the average visibility for all Ribes bushes is 7.80 feet.

Table No. 62 The transects with Ribes have much less merchantable white pine per acre than do the transects without Ribes.

The transects with Ribes have fewer white pine poles per acre than do the transects without Ribes.

The transects with Ribes have slightly fewer white pines, seedlings and saplings per acre than do the transects without Ribes.

A lower percent of the transects with Ribes have merchantable white pine than of the transects without Ribes.

A lower percent of the transects with Ribes have white pine poles than of the transects without Ribes.

A higher percent of the transects with Ribes have white pine seedlings and saplings than of the transects without Ribes.

Tables 63 Figs. 1-2-3 In the 4 feet visibility class there are 2.8 transects without Ribes to each transect with Ribes.

In the 6 feet visibility class, there are 3.25 transects without Ribes to each transect with Ribes.

In the 8 feet visibility class, there are 3.7 transects without Ribes to each transect with Ribes.

In the 10 feet visibility class, there are 4.1 transects without Ribes to each transect with Ribes.

In the 12 feet visibility class, there are 4.5 transects without Ribes to each transect with Ribes.

In the 14 feet visibility class, there are 5.1 transects without Ribes to each transect with Ribes.

In the 16 feet visibility class, there are 5.8 transects without Ribes to each transect with Ribes.

In the 18 feet visibility class there are 6.9 transects without Ribes to each transect with Ribes.

In the 20 feet visibility class there are 8.6 transects without Ribes to each transect with Ribes.

In the visibility classes over 20 feet, transects with Ribes are practically lacking.

Table No. 58

	Acreage in Area	No. of 1 Chain Transects Run within Area	No. Transects Without Ribes	% of 1 Chain Transects Without Ribes	Ribes on Area Based on Transects Run					No. of Merchantable W.P. per Acre 8" and above	Bd. Ft. per Acre of W. P.	W. P. Reproduction per Acre		Altitude	
					No. Bushes per Acre	Distribution									
						Heavy Ribes Growth		Light Ribes Growth							
						% of Acreage	No. Bushes Per Acre	% of Acreage	No. Bushes per Acre			Poles 3" to 8"	Seedlings Under 3"	Dominant	Range
Area #1 Upper Priest River	2310	909	746	82.1	37.21	6.3	490.0	93.7	6.8	30.84	15105.0	2.75	10.3	4000	3500 5500
Area #2 Pend Oreille River	16000	1163	1084	93.2	12.97	1.1	574.0	98.9	6.68	4.09	737.7	20.3	57.1	2000	1700 3000
Area #3 Sullivan Lake	615	281	171	60.9	149.17	26.7	537.06	73.3	6.9	2.42	1003.0	6.1	219.3	4000	2800 5500
Area #4 Salmon River	1800	761	322	42.3	233.74	49.3	467.6	50.7	6.53	15.71 1.31*	5900.0 *61.7	2.4	16.9	5000	4600 6500

*P. albicaulis.

Table No. 59
CONTROL RECONNAISSANCE
Analysis of Visibility Conditions,
by Transects.

Area	Character of Transect		VISIBILITY 4	6	8	10	12	14	16	18	20	22	24	30	40	Average Visibility
Upper Priest River	With Ribes	No.	14	41	32	31	19	12	9		5					9.25
		%	8.6	25.1	19.6	19.0	11.7	7.4	5.5		3.1					
	Without Ribes	No.	30	55	86	145	153	108	74	38	50	5	5			12.06
		%	4.0	7.3	11.5	19.3	20.4	14.4	9.9	5.1	6.7	0.7	0.7			
Pend O'reille River	With Ribes	No.	1	8	14	15	18	27	14	3						11.86
		%	1	8	14	15	18	27	14	3						
	Without Ribes	No.	3	99	237	273	213	17	37	10	22		5			10.22
		%	0.3	10.8	25.9	29.8	23.3	1.9	4.0	1.1	2.4		0.5			
Sullivan Lake	With Ribes	No.		20	22	40	17	1	8		4			1		10.19
		%		17.7	19.5	35.4	15.0	0.9	7.1		3.5			0.9		
	Without Ribes	No.	1	8	21	42	23	8	29	5	19		5	3	7	14.34
		%	0.6	4.7	12.3	24.5	13.5	4.7	16.9	2.9	11.1		2.9	1.8	4.1	
Salmon River	With Ribes	No.	78	95	117	85	50	5	5			1				7.89
		%	17.9	21.8	26.8	19.5	11.5	1.1	1.1			0.3				
	Without Ribes	No.	21	32	66	63	64	38	26	2	6	3	1			10.54
		%	6.5	9.9	20.5	19.6	19.9	11.8	8.1	0.6	1.9	0.9	0.3			
Average of Areas 1.2.3 & 4	With Ribes	No.	93	164	185	171	104	45	36	3	9	1		1		8.98
		%	11.45	20.20	22.78	21.06	12.81	5.54	4.44	0.37	1.11	0.12		0.12		
	Without Ribes	No.	55	194	410	523	453	171	166	55	97	8	16	3	7	11.23
		%	2.55	8.99	19.0	24.24	20.99	7.92	7.69	2.55	4.49	0.37	0.74	0.15	0.32	
Grand Total		No.	148	358	595	694	557	216	202	48	106	9	16	4	7	10.34
		%	4.98	12.05	20.03	23.37	18.75	7.27	6.80	1.96	357	0.30	0.54	0.13	0.24	

Table 60

CONTROL RECONNAISSANCE

Number of Ribes Bushes by Species in Each Visibility Class

Area	Ribes Species		Total No. Ribes	VISIBILITY 4	6	8	10	12	14	16	18	20	22	24	30	40	Average Visibility In Feet
Upper Priest River	R. lac.	No	811	73	366	158	122	56	14	11	-	11	-	-	-	-	
		%		9.00	45.13	19.48	15.04	6.90	1.73	1.36		1.36					7.69
	R. vis.	No.	63	14	15	5	5	14	4	4	-	2	-	-	-	-	
		%		22.22	23.81	7.94	7.94	22.22	6.35	6.35		3.17					8.95
	Total	No.	874	87	381	163	127	70	18	15		13					
		%		9.95	43.61	18.65	14.53	8.01	2.06	1.71		1.48					7.78
Pend Oreille River	R. lac.	No.	264	10	82	55	37	24	26	25	5	-	-	-	-	-	
		%	100%	3.79	31.07	20.83	14.01	9.09	9.85	9.47	1.89						9.41
	R. vis.	No.	158	-	1	19	16	15	84	21	2	-	-	-	-	-	
		%	100%		0.63	12.03	10.13	9.49	53.16	13.29	1.27						12.8
	Total	No.	422	10	83	74	53	39	110	46	7	-	-	-	-	-	
		%	100%	2.37	19.67	17.53	12.56	9.24	26.07	10.90	1.66						10.73
Sullivan Lake	R. lac.	No.	755	-	165	109	282	152	11	27	-	5	-	-	4	-	
		%	100%	-	21.85	14.44	37.35	20.13	1.46	3.58		0.66			0.53		9.68
	R. vis.	No.	330	-	94	64	109	57	5	1	-	-	-	-	-	-	
		%	100%		28.49	19.39	33.03	17.27	1.52	0.30							8.90
	Total	No.	1085	-	259	173	391	209	16	28	-	5	-	-	4	-	
		%			23.88	15.94	36.03	19.26	1.47	2.58		0.47			0.37		9.45
Salmon River	R. lac.	No.	4517	866	1474	1291	631	195	33	18	-	-	9	-	-	-	
		%	100%	19.17	32.63	28.58	13.97	4.32	0.73	0.40			0.20				7.13
	R. vis.	No.	5	-	-	2	1	2	-	-	-	-	-	-	-	-	
		%	100%			40	20	40									10.00
	Total	No.	4522	866	1474	1293	632	197	33	18	-	-	9	-	-	-	
		%	100%	19.15	32.60	28.59	13.98	4.36	0.72	0.40			0.20				7.75
Grand Total	R. lac.	No.	6347	949	2087	1613	1072	427	84	81	5	16	9	-	4	-	
		%	100%	14.94	32.87	25.40	16.88	6.81	1.31	1.27	0.07	0.25	0.14		0.06		7.60
	R. vis.	No.	556	14	110	90	131	88	93	26	2	2	-	-	-	-	
		%	100%	2.52	19.78	16.19	23.56	15.83	16.72	4.68	0.36	0.36					9.32
	Total	No.	6903	963	2197	1703	1203	515	177	107	7	18	9	-	4	-	
		%	100%	13.95	31.83	24.67	17.43	7.46	2.56	1.55	0.10	0.26	0.13		0.06		7.80

Table 61

CONTROL RECONNAISSANCE

WHITE PINE DATA

Area		No. of Transects	No. Bd. Ft. per Acre	No. Poles per Acre	No. Seedlings per Acre	% of Transects With Timber	Bd. Ft. per Acre Transects With Timber	REPRODUCTION			
								% of Transects With Poles	No. of Poles per Acre Transects With Poles	% of Transects With Seedlings	No. of Seedlings per Acre on Transects with Seedlings
Area #1 Upper Priest River	Ribes	163	9,568	1.4	36.8	25.8%	37,135'	2.5%	60	20.9%	176.5
	Ribes Less	746	16,315	3.02	4.5	41.4%	39,408'	5.4%	56.5	5.0%	90.0
Area #2 Pend Oreille River	Ribes	79	433	17.2	49.6	6.3%	6,840'	16.5%	104.6	41.8%	118.8
	Ribes Less	1,084	760	20.5	57.6	6.5%	11,692'	18.9%	108.5	27.0%	213.3
Area #3 Sullivan Lake	Ribes	110	0.0	5.8	177.8	0.0%	0.0	10.%	58.2	76.4%	232.9
	Ribes Less	171	1,648.2	6.3	245.9	5.3%	31,098	9.9%	63.6	64.9%	378.8
Area #4 Salmon River	Ribes	439	5,238	0.2	5.6	18.9%	27,706'	0.5%	40	5.9%	95.4
	Ribes Less	322	6,802	5.4	32.2	37.6%	18,090'	8.7%	62.1	18.3%	175.9

Table 62

WHITE PINE DATA

Area	Transects	Total of Area		Merchantable				Poles				Seedlings			
				With		Without		With		Without		With		Without	
		% of Area	Acreage	% of Area	Acreage	% of Area	Acreage	% of Area	Acreage	% of Area	Acreage	% of Area	Acreage	% of Area	Acreage
1-Upper Priest River	With Ribes	17.9	413.5	4.62	19.1	95.38	394.4	0.45	1.9	99.55	411.6	3.74	15.5	96.26	398.0
	Without Ribes	82.1	1896.5	33.99	644.6	66.01	1251.9	4.43	84.0	95.57	1812.5	4.11	78.0	95.89	1818.5
	Total	100.0	2310.0	28.73	663.7	71.27	1646.3	3.72	85.9	96.28	2224.1	4.05	93.5	95.95	2216.5
2-Pend Oreille River	With Ribes	6.8	1088.0	0.43	4.7	99.57	1083.3	1.12	12.2	98.88	1075.8	2.84	30.9	97.16	1057.1
	Without Ribes	93.2	14912.0	6.06	903.7	93.94	14008.3	17.61	2626.0	82.39	12286.0	25.16	3751.9	74.84	11160.1
	Total	100.0	16000.0	5.68	908.4	94.32	15091.6	16.49	2638.2	83.51	13361.8	23.64	3782.8	76.36	12217.2
3-Sullivan Lake	With Ribes	39.1	240.5	0.0	0.0	100.0	240.5	3.91	9.4	96.09	231.1	29.87	71.8	70.13	168.7
	Without Ribes	60.9	374.5	3.23	12.1	96.77	362.4	6.03	22.6	93.97	351.9	39.52	148.0	60.48	226.5
	Total	100.0	615.0	1.97	12.1	98.03	602.9	5.20	32.0	94.80	583.0	35.74	219.8	64.26	395.2
4-Salmon River	With Ribes	57.7	1038.6	10.91	113.3	89.09	925.3	0.30	3.1	99.70	1035.5	3.39	35.2	96.61	1003.4
	Without Ribes	42.3	761.4	15.90	121.1	84.10	640.3	3.68	28.0	96.32	733.4	7.74	58.9	92.26	702.5
	Total	100.0	1800.0	13.02	234.4	86.98	1565.6	1.87	31.1	98.13	1768.9	5.23	94.1	94.77	1705.9
Total of 4 Areas	With Ribes	13.4	2780.6	4.93	137.1	95.07	2643.5	0.96	26.6	99.04	2754.0	5.50	153.4	94.50	2627.2
	Without Ribes	86.6	17944.4	9.37	1681.5	90.63	16262.9	15.39	2760.6	84.61	15183.8	22.49	4036.8	77.51	13907.6
	Total	100.0	20725.0	8.77	1818.6	91.23	18906.4	13.45	2787.2	86.55	17937.8	20.22	4190.2	79.78	16534.8
Total of Areas 1-2-3	With Ribes	9.2	1742.0	1.37	23.8	98.63	1718.2	1.35	23.5	98.65	1718.5	6.77	118.2	93.23	1623.8
	Without Ribes	90.8	17183.0	9.08	1560.4	90.92	15622.6	15.90	2732.6	84.10	14450.4	23.16	3977.9	76.84	13205.1
	Total	100.0	18925.0	8.38	1584.2	91.62	17340.8	14.56	2756.1	85.44	16168.9	21.65	4096.1	78.35	14828.9

Table 63. Figure 1

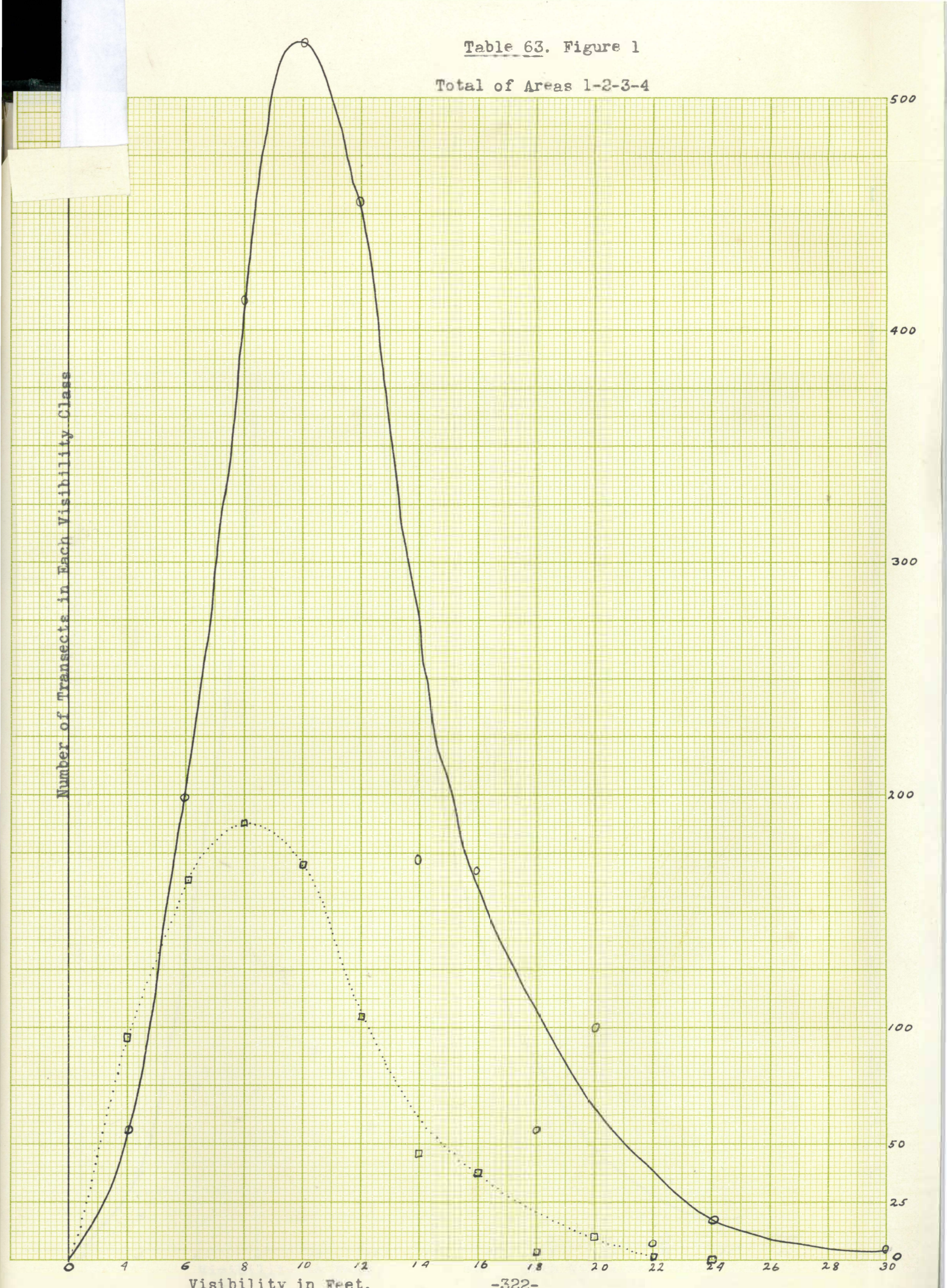
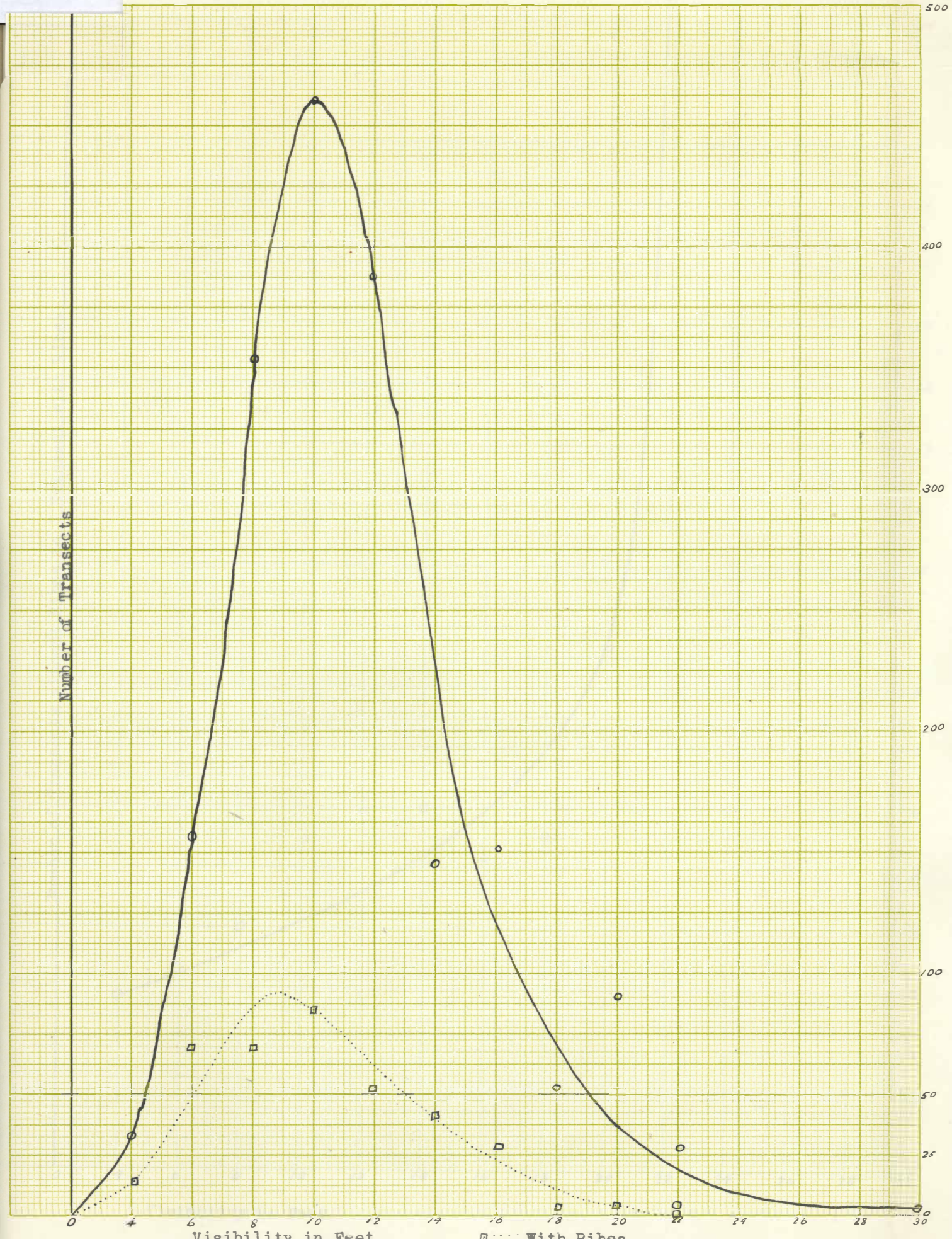
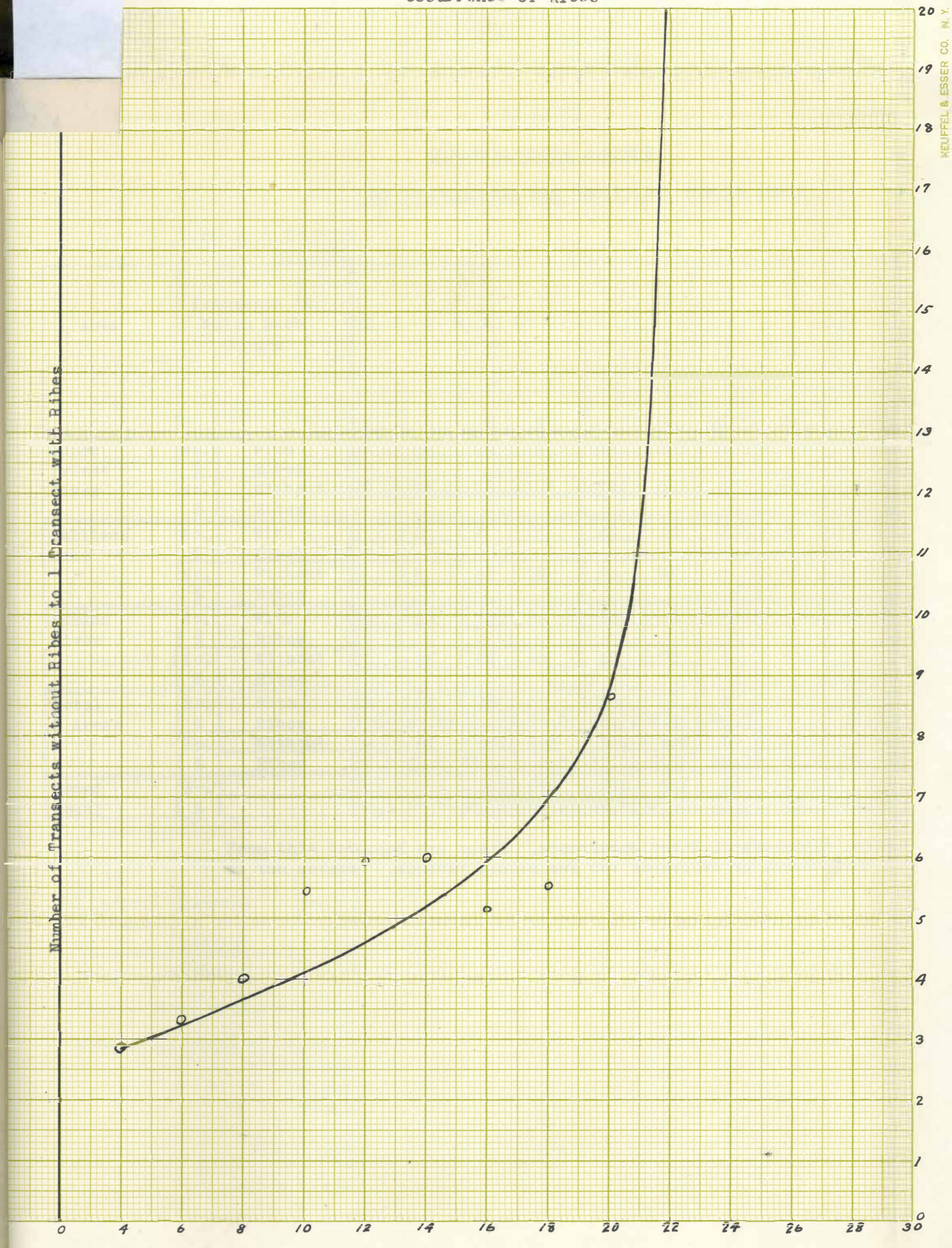


Table No. 63. Figure 2

Control Reconnaissance
Total of Areas 1-2-3-4
Transect Analyses



Control Reconnaissance
Totaled Conditions on Areas 1-2-3 Table No. 63. Figure 3
Occurrence of Ribes



SHRUB GROWTH CONDITIONS AND ASSOCIATIONS ON TRANSECTS

Area	Transects in Which Each Occurs		Total No Transects Worked	HEIGHT										DENSITY										Pachystima	Echinopanax	Rubus	Vaccinium	Alnus	Ferns	Taxus	Herbaceous	Acer	Salix	Pyrus	Lonicera	Amelanchier	Epilobium	Menziesia	Ceanothus	Coniferous Reproduction	Rhododendron	Prunus	Rosa	Cornus	Sambucus	Berberis	Sorbus	Juniperus	Symphoricarpos	Philadelphus
				0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10																									
Upper Priest River	No.	With Ribes	163	9	6	24	58	26	5	9	3	4	-	3	17	30	17	10	26	22	21	5	8	1	2	50	42	42	46	21	26	6	13	37	4	2	14	2	5	19	-	6	4	1	1	-	-	-	-	-	-	-
	%																																																	
	No.	Without Ribes	746	171	69	194	192	74	22	16	3	1	1	3	226	167	127	88	47	22	28	12	11	8	10	292	76	107	229	46	72	50	43	132	4	23	99	21	1	24	-	6	25	3	4	3	-	6	1	1	-	-
	%																																																
Sullivan Lake	No.	With Ribes	110	58	5	7	20	6	4	3	-	-	-	1	58	25	10	3	5	1	1	-	-	-	-	5	1	7	15	15	-	-	-	8	13	-	17	5	-	22	1	-	-	-	1	1	-	-	-	-	-
	%																																																
	No.	Without Ribes	171	67	16	29	39	13	9	0	-	-	-	-	70	59	23	14	3	-	2	-	-	-	-	-	1	4	66	30	-	-	-	8	1	5	17	17	-	20	-	-	-	-	1	5	-	-	-	-	1	2	1
	%																																																
Salmon River	No.	With Ribes	439	11	12	105	235	56	14	5	-	1	-	-	18	28	48	67	62	46	42	59	53	15	1	49	2	157	262	82	50	3	44	29	-	23	104	-	-	249	-	-	-	-	3	2	-	-	-	-	-
	%																																																
	No.	Without Ribes	322	36	20	104	123	26	9	-	1	-	-	-	50	61	54	53	28	27	17	17	12	3	-	81	-	29	218	29	6	-	3	6	-	8	55	-	-	166	-	-	12	2	-	-	1	1	-	-	-	-
	%																																																
Total 3 Areas	No.	With Ribes	712	78	23	136	313	88	23	17	3	5	-	4	93	83	75	80	93	69	64	64	61	16	3	104	45	206	323	118	76	9	57	74	17	25	135	7	5	290	1	6	4	1	2	4	2	-	-	-	-	-
	%		36.49	10.96	3.23	19.10	43.96	12.36	3.23	2.39	0.42	0.71	-	0.57	13.06	11.66	10.53	11.24	13.06	9.69	8.98	8.98	8.57	2.25	0.42	14.61	6.32	28.93	45.37	16.57	10.67	1.26	8.01	10.39	2.39	3.51	18.96	0.98	0.70	40.73	0.14	0.84	0.56	0.14	0.28	0.56	0.28	-	-	-	-	-
	No.	Without	1239	274	105	327	464	113	40	16	4	1	1	3	346	287	204	155	78	49	47	29	23	11	10	373	77	140	513	105	78	50	46	146	5	36	171	38	1	210	-	6	38	6	9	3	1	7	1	2	2	1
	%	Ribes	63.51	22.11	8.47	26.39	36.64	9.12	3.23	1.26	0.32	0.08	0.08	0.24	27.95	25.16	16.46	12.51	6.30	3.95	3.79	2.34	1.86	0.89	0.81	30.10	6.21	11.30	41.41	8.47	6.29	4.04	3.71	11.78	0.40	2.91	13.80	3.07	0.08	16.95	-	0.48	3.07	0.48	0.73	0.24	0.08	0.57	0.08	0.16	0.16	0.08
Grand Total	No.		1951	352	128	463	767	201	63	33	7	6	1	11	439	370	279	235	171	118	111	93	84	27	13	477	122	346	836	223	154	59	103	220	22	61	306	45	6	500	1	12	42	7	11	7	3	7	1	2	2	1
	%		100.0	18.04	6.56	23.73	39.31	10.30	3.23	1.69	0.36	0.31	0.05	0.56	22.50	18.96	14.30	12.05	8.76	6.05	5.69	4.76	4.31	1.38	0.66	24.45	6.25	17.73	42.85	11.43	7.89	3.02	5.28	11.28	1.13	3.13	15.61	2.31	0.31	25.63	0.05	0.62	2.15	0.36	0.56	0.36	0.15	0.36	0.05	0.10	0.10	0.05

From this tabulation, four brush genera appear to be outstanding positive indicators of Ribes occurrence. These are Rubus, Alnus, Lonicera and Menziesia. Pachystima is the only decidedly negative indicator of the several brush genera. The other genera are either indifferent indicators, or represent too few actual records.

PROJECT 4.

INSPECTION OF NURSERY SHIPMENTS FOR VIOLATIONS OF BLISTER RUST QUARANTINES, IN COOPERATION WITH THE FEDERAL HORTICULTURAL BOARD.

Quarantine inspection work was carried on during the spring shipping season of 1923 at Denver, Colorado; Ogden, Utah; Pendleton, Oregon; Spokane, Washington; Pasco, Washington; Seattle, Washington; Tacoma, Washington; and Portland, Oregon. During the course of this work, 40 violations of Federal and State blister rust quarantines were detected. Tables No. & No. give an analysis of the violations detected and the plant shipments inspected during the spring inspection season.

Table 68.

Quarantine Violations
March 1st to May 31st, 1923.

Shipper	Transporting Agency.	Federal Quarantine No. 26			Federal Quarantine No. 54			State Quarantine Nos 7 - 12 - 13		
		Black Currants	Other Ribes	White Pine	Black Currants	Other Ribes	White Pine	Black Currants	Other Ribes	White Pine
Nursery	Parcel Post	1-1				2-7			1-2	
	Express		1-20			2-15				
	Freight									
Individual	Parcel Post		1-4		1-2	8-114	1-2*		10-62	4-10
	Express	1-2		1-5		4-59			2-14	
	Freight								1-2	
	Total	2-3	2-24	1-5	1-2	16-195	1-2		14-80	4-10

*These pines contained with Ribes: hence not separate violation.

Violations found in parcel post....28
" " " express.....11
" " " freight.....1
Total 40

Violations Quarantine 54.....17
" " 26..... 5
" State "7,12, 13.....18
Total 40

Violations by nurserymen.....7 (1-1 black currant.
6-44 other Ribes)
" " individuals.....33(2-4 black currants,
(26-255 other Ribes,
(5-15 white pine)
(1-2* " ")

Table No. 66

Plant Shipments Inspected - Spring 1923

Inspection Point	Period of Inspection	Number From			Number Inspected	Number Not Inspected	Number of Violations	Number Shipments Reported to States	Number Without Inspection Tag
		Eastern Quar. Zone	Western Quar. Zone	Not Quar. Zone					
PARCEL POST									
Pendleton	3/8 to 4/23	32	86	407	49			234	
Denver	3/13 to 4/30	819	32	907	835	1,104			
Spokane	3/3 to 5/16	5,002	1,406	556	6,697	99	3	761	29
Ogden	3/12 to 4/24	238	19	136	404			380	14
Pasco	3/12 to 4/28	3	30	107	89	48		110	9
Portland	12/15,1922 - 5/17,1923	191	313	197	514	161	3	81	16
Seattle	3/1 to 4/23	160	184	796	1,207		17	94	37
Tacoma	12/15,1922 - 4/29,1923	263	570	207	1,026	9	3	201	68
Total		6,708	2,640	3,314	10,821	1,421	26	1,861	173
EXPRESS									
Pendleton	3/8 to 4/23	51	131	560	177	11	1	243	11
Denver	3/13 to 4/30	1,494	25	1,124	1,165	1,308		5	
Spokane	3/3 to 5/16	289	1,283	532	1,914	98	4	546	20
Ogden	3/12 to 4/24	208	9	108	307	12		512	5
Pasco	3/12 to 4/28	8	186	251	188	246	1	335	14
Portland	12/15,1922 - 5/17,1923	376	205	1,041	711	718	3	544	10
Seattle	3/1 to 4/23	102	110	495	687		1	84	2
Tacoma	12/15,1922 - 4/29,1923	32	93	96	200	11	3	26	16
Total		2,560	2,042	4,207	5,349	2,404	13	2,295	78
FREIGHT									
Pendleton	3/8 to 4/23	17	17*	48	22			48*	
Denver	3/13 to 4/30	47	68*	135	213	13		202*	3
Spokane	3/3 to 5/16		15	77	8	75		80	
Ogden	3/12 to 4/24	27	4	35	59	9		72	1
Pasco	3/12 to 4/28		15	50		64		61	
Portland	12/15,1922 - 5/17,1923	34	40	41	68	37		58	
Seattle	3/1 to 4/23		29	48	35	9		36	
Tacoma	12/15,1922 - 4/29,1923	3	131	33	41	126	1	126	2
Total		128	319	467	446	333	1	683	6

*Five carloads. Total shipments 22,385. Total violations 30.

Quarantine inspection for the fall shipping season of 1923 was carried on at Pendleton and Portland, Oregon; Spokane, Pasco and Seattle, Washington. Twenty violations were intercepted during this season. Tables No. 67 and No. 68 give an analysis of the violations detected and the plant shipments inspected during the fall inspection season.

Table 67

Quarantine Violations

June 1st to December 1st, 1923.

Shipper	Transporting Agency	Federal Quarantine No. 26			Federal Quarantine No. 54			State Quarantines Nos. 7 - 12 - 13		
		Black Currants	Other Ribes	White Pine	Black Currants	Other Ribes	White Pine	Black Currants	Other Ribes	White Pine
Nursery	Parcel Post									
	Express									
	Freight									
Individual	Parcel Post		2-7	2-5		4-5	2-6		1-8	3-9
	Express					1-12	1-?		2-11	
	Freight									
	Unknown	1-?			1-?					
Total		1-?	2-7	2-5	1-?	5-17	3-6		3-19	3-9

Violations found in parcel post.....14
" " " express..... 4
" " " Freight..... 0
unknown 2
Total 20

Violations by nurserymen.....0
" " individuals.....20
Total 20
(2-? Black currants
(10-43 Other Ribes;
(8-20 White Pine.)

Violations Quarantine 54.....9
" " 26.....5
" State " 7-12-13.....6
Total 20

Table No. 68
Plant Shipments Inspected - Fall 1923.

Inspection Point	Period of Inspection.	Number From Eastern Quar. Zone	Number From Western Quar. Zone	Number From Not Quar. Zone.	Number Inspected	Number Not Inspected	Number of Violations	Number Shipments Reported States	Number Without Inspection Tag
				P A R C E L P O S T					
Pendleton	11/3 to 11/28	8	19	74	73	28		19	
Spokane	10/26 - 11/29	371	83	64	421	85	1	1	1
Pasco	10/20 - 11/29	1	7	38	29	17		4	1
Portland	10/9 - 11/29	2,323	1,657	1,583	1,792			258	31
Seattle	10/9 - 11/26	68	345	129	497		13	474	15
Total		2,771	2,111	1,888	2,812	130	14	756	48
				E X P R E S S					
Pendleton	11/3 - 11/28	44	53	50	131	16		35	
Spokane	10/26 - 11/29	52	153	38	109	11		33	1
Pasco	10/20 - 11/29	3	76	109	133	55		12	1
Portland	10/9 - 11/29	102	205	192	467	27	1	323	68
Seattle	10/9 - 11/26	93	132	98	319		2	317	2
Total		294	619	487	1,159	109	3	720	72
	FREIGHT								
Pendleton	11/3 - 11/28		25	6	25	6		25	
Spokane	10/26 - 11/29	2	13	12	18	3		20	
Pasco	10/20 - 11/29		11	46	4	53		10	
Portland	10/9 - 11/29	37	510	157	352	476		580	10
Seattle	10/9 - 11/26	15	29	1	35	538		35	
Total		54	588	222	434	1,076		670	10

3 violations reported by states.

Through the active cooperation of the Oregon State Board of Horticulture, the expenses of the fall quarantine inspection work at Portland were defrayed by the State of Oregon. This permitted the release of Mr. Goodding from quarantine inspection work, in order to permit him to carry on the fall school campaign in Oregon.

Table No. 69 gives a complete analysis of the violations that have been intercepted by the inspectors of this office, during the spring and fall season of 1923. One violation contained both pine and Ribes and in two cases the complete data was not known hence this table is an analysis of only 57 instead of 60 violations.

This table indicates the following facts:

1. 23 violations of State Quarantine 7, 12, and 13, were intercepted. 22 of these bore no inspection tag. 16 of these violations were either currants or gooseberries, 10 of which were in leaf.

2. 28 violations of Federal Quarantine 54 were intercepted, 19 of these bore no inspection tag. 23 were shipments of currants or gooseberries, 12 of which were in leaf.

3. 6 violations of Federal Quarantine 26 were intercepted, 5 of these bore no inspection tag. 3 of these shipments were currants or gooseberries, 2 of which were in leaf.

Table No. 70 gives a summary of table 69 by grouping together all of the violations and analyzing them according to those having inspection tags or not and whether the Ribes were in leaf or not.

This table shows the following facts:

1. Of the 57 violations intercepted 46 were without an inspection tag.

2. Of the 57 violations 14 were pine shipments consisting of 36 white pines and 43 were Ribes shipments consisting of 371 plants.

3. Of the 43 Ribes shipments 24 consisting of 200 plants bore leaves while 19 consisting of 171 plants were dormant. Shipments of Ribes in the spring which were reported as bearing leaves consist of plants with young leaves, from $\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter. Shipments in leaf made in the fall are plants bearing mature leaves. Shipments of Ribes in leaf are generally made by private individuals, but occasional shipments in leaf are made by nurserymen.

Educational Work Concerning Plant Regulations

Table No. 70 reveals the fact that 81% of the violations of Blister Rust Quarantines intercepted during the spring-fall season of 1923 bore no inspection tag. If this 81 percent had been inspected these violations would not likely have been committed.

If measures were taken to refresh the minds of all transporting agencies, inspectors and nurserymen in a quarantined area regarding the Blister Rust regulations and regarding the necessity of nursery shipments being inspected and bearing an inspection tag, very probably the number of violations would be greatly reduced. Due to the constant changing of members of these organizations it would seem desirable to call their attention to this information

Table 69

Tabulation of Violations Intercepted by Our Inspectors Spring-Fall 1923.

Transporting Agency	VIOLATIONS OF																	
	State Quarantines Nos. 7, 12, 13						Federal Quarantine No. 54						Federal Quarantine No. 26					
	No Inspection Tag			Inspection Tag			No Inspection Tag			Inspection Tag			No Inspection Tag			Inspection Tag		
	Ribes			Ribes			Ribes			Ribes			Ribes			Ribes		
	Bearing Leaves	Leafless	Pine	Bearing Leaves	Leafless	Pine	Bearing Leaves	Leafless	Pine	Bearing Leaves	Leafless	Pine	Bearing Leaves	Leafless	Pine	Bearing Leaves	Leafless	Pine
P. P.	8-42	3-29	7-16	1-2	0	0	7-61	6-30	2-7	3-57	1-4	2-6	0	1-7	2-5	0	0	0
Exp.	1-7	3-18	0	0	0	0	2-27	1-23	1-2	0	3-40	0	2-4	0	0	0	1-20	0
Total	9-49	6-47	7-16	1-2	0	0	9-88	7-53	3-9	3-57	4-44	2-6	2-4	1-7	2-5	0	1-20	0
Total	15-96		7-16	1-2		0	16-141		3-9	7-101		2-6	3-11		2-5	1-20		0

Table 70

Transporting Agency	No Inspection Tag				Inspection Tag			
	Ribes				Ribes			
	Bearing Leaves	Leafless	Pine	Total	Bearing Leaves	Leafless	Pine	Total
P. P.	15-103	10-66	11-28	36-197	4-59	1-4	2-6	7-69
Exp.	5-38	4-41	1-2	10-81	0	4-60	0	4-60
Total	20-141	14-107	12-30	46-278	4-59	5-64	2-6	11-129

at least once a year preferably about the beginning of the nursery shipping season, that is about March first.

The following are extracts taken from correspondence to illustrate the lack of information ragarding the regulations controlling the shipment of plants and emphasizing the need for more educational work in this work.

Statement by Federal Inspector at Pasco - May 1923:

"Employees of the postal department and express company need a little drilling regarding the shipment of nursery stock unless it is accompanied by a certificate of inspection. If they follow their instructions most of these shipments would be stopped and a grave danger of carrying plant diseases and insect pests from one locality to another would be stopped. Many people are not familiar with regulations and are not to be blamed for their ignorance of these laws but the above mentioned employees should follow these instructions more carefully. Possibly some form of a reminder just before shipping time for nursery stock would freshen their memories."

Statements by violators:

Mr. Geo. E. Gibson, Aberdeen, Washington, March 6, 1923. "I also notice in No. 54 that due notice will be given to the transportation companys. Why did not they tell me of the law?"

Mrs. Florence E. Breahey, Bellingham, Washington, April, 1923. "It is strange our postman excepted the package as I left the ends sticking out and surely they know of the law in our office here."

Lizzie Schatz, Tacoma, Washington, April 25, 1923. "It was certainly the duty of the post office clerk to inform me when I presented the small package for mailing which contained two small Ribes which grow in the woods around here, that they must be inspected before mailing. Whereas he accepted the package without comment although one end was left open to show contents and I paid 31¢ postage."

Joe Smith, Long Branch, Washington, April 7, 1923. "This is the last information that I had on the subject until, about ten days ago, the local post mistress remarked that there was a new quarantine order out. I asked her for a copy of it which she gave me and in it I discovered that the quarantine was on."

Home Nursery Co., Richland, Washington, April 11, 1923. "Indirectly, I had learned from the postmaster and the express agents that the exportation of currants and gooseberries out of the state was not permitted by mail or express."

Spokane Seed Co., Spokane, Washington, April 23, 1923. "We recently called up the local horticultural department for advice as to shipping flowering currant out of the state and he advises that there is no law prohibiting the shipment of these."

Joe Smith, Long Branch, Washington, April 7, 1923. "My nursery was inspected in January by Mr. R. W. Huff and I specifically asked him in regard to the shipment of currants and gooseberries, knowing that they had been quarantined last year, and he specifically told me that their shipment was allowed, except black currants."

Analysis of Two Years Inspection Work

An analysis of the violations that have been recorded (Table 71) during the last two years shows that 533 violations of state or federal quarantines have been intercepted here in the West, 34 of these being white pine shipments. Of this number 71 percent were by nurserymen and 29 percent were by individuals. (Table 72). Analyzing these violations by seasons (Table 73) however, shows that while during the spring of 1922 78% were by nurserymen the percentage has gradually decreased until no nurserymen were detected violating the quarantine during the fall of 1923. The first season showed 22% by individuals while the last season showed 100%. In other words, the violations by nurserymen have decreased and all violations during the last season have been by individuals. The violations by individuals have decreased about 50% during the same period. It would appear as improbably that all violations by individuals will ever reach the zero point.

Table 71

	Number Shipments Inspected				VIOLATIONS									
					Parcel Post		Express		Freight		Total		Percentage by	
Season	PP	Exp.	Frt.	Total	Ribes	Pine	Ribes	Pine	Ribes	Pine	Ribes	Pine	Nurserymen	Individuals
Fall 1923	6670	1400	864	8934	7	7	3	1	0	0	12*	8	0	100
Spring 1923	12662	8809	1004	22475	24	5	10	1	1	0	36**	5*	17.5	82.5
Spring & Fall 1922					107	7	79	14	8	0	451	21	78	22
Total	19332	10209	1868	31409	138	19	92	16	9	0	499	34		

*Method of shipment unknown in two cases.
**One violation of Ribes and pine combined.

Table 72

Shipper	Fall-Spring 1922		Spring 1923		Fall 1923		Total		Grand Total	Percentage	Percentage	
	Ribes	Pine	Ribes	Pine	Ribes	Pine	Ribes	Pine			Ribes	Pine
Nurserymen	363	5	7	0	0	0	370	5	375	71	74.3	17.3
Individuals	88	12	28	6	12	8	128	24	152	29	25.7	82.7
Total	451	17	35	6	12	8	498	29	527*	100	100	100

*Shipper not known in 6 cases.

Comparing the violations of the season Spring-Fall 1922 with that of the Spring-Fall 1923 season a considerable decrease of the number of Ribes shipments is apparent. However, there is no appreciable decrease in the number of shipments of pine. Further the pine shipments are made entirely by individuals during the 1923 season.

It is very important to know the importance of the different means of transportation from the standpoint of efficient inspection work. Table shows the violations by seasons that have been intercepted and the transportation agency carrying the violation.

Table 73
Transporting Agency Carrying Violation.

	Parcel Post		Express		Freight	
	Violations	% of Total	Violations	% of Total	Violations	% of Total
Fall-Spring 1922	114	53	93	43	8	4
Fall-Spring 1923	43	72.9	15	25.4	1	1.7

From this table it is evident that during the 1922 season about half of the violations were by Parcel Post and during the 1923 season about 3/4 were by Parcel Post. Likewise table shows that the number of shipments by Parcel Post far exceeds that of both express and freight.

Table 74 gives an analysis of the violations according to shipper and transporting agency. The data given in this table was known in the case of only 274 violations hence the table is based on that number of violations.

Table 74.

Shipper	Parcel Post		Express		Freight	
	Violation	%	Violation	%	Violation	%
Nursery	61	51.2	54	45.3	4	3.5
Individuals	96	61.9	54	34.8	5	3.3
Total	157	57.3	108	39.4	9	3.3

This table indicates that both nurserymen and individuals have violated more by Parcel Post than by any other means.

The whole analysis of the shipments of nursery stock and violations indicates that Parcel Post is the most dangerous agency at present. In other words inspection of express and freight is not fifty percent efficient in controlling the movement of plant pests. Two seasons' experience has shown that 61% of the plant shipments are made by Parcel Post and 57% of the violations have been made by Parcel Post.

Confidential Information on Quarantine Work.

During the inspection season of 1923 an effort was made to get some definite information regarding quarantine conditions as they had come to the attention of the inspectors in the West. A set of six questions was sent to each inspector asking for an answer according to conditions as he knew them. Since this information is confidential no inspectors' names are given, but the original signed statements are on file. In the following report of the results of this questionaire, the question is stated and the answer received from each inspection point is indicated under the nameof that point.

Question No. 1.

Have you had any indication either from your correspondence or personal relations that the state inspectors did not know their own state regulations regarding blister rust? Are they enforcing them?

Ogden: "The State inspector of Utah and his deputies are thoroughly aware of the blister rust quarantine and I believe enforcing it to the best of their ability. This is especially true of the Weber

county inspector. Utah was the first state to put a quarantine on the entire state of Washington."

Spokane: "I have never had an immediate answer from any of the state inspectors to my various questions regarding state quarantines. They have either asked me just what was the state quarantine or else they have consulted some book or some person while I waited. I believe that their fruit tree problems keep them so occupied that it is not practicable for them to watch these other quarantines with the present limited force of men. Had it not been for an incident which occurred the last day of my inspection at Spokane, which is mentioned later, I should have believed that the particular deputy who has been doing the actual inspection was trying to enforce the Blister Rust quarantines, but with this one case as evidence, my confidence in his watchfulness is shaken. Previous to that incident, I believed he was watching carefully for blister rust violations. It may be that this single case was merely a slip."

Pasco: "I have not had any correspondence or conversation with any of the state inspectors so could not answer from that as to their work in enforcing state or federal regulations regarding blister rust. There is no state inspector stationed at this point and as I was familiar with state horticultural laws I have made a practice of inspecting such shipments as I have seen in transit which did not have a certificate of inspection by a state officer. While I have not had any dealings with the state inspectors while stationed at Pasco I know that they are making an effort to enforce state laws regarding black currants on the west side of the state. The district inspectors have refused licenses to nurserymen until they have destroyed their black currants."

Portland: "I have noticed no laxness whatever in the enforcement of Oregon quarantines. I have, however, reported two violations that would seem to indicate lack of knowledge of the federal quarantines by two Washington inspectors whose names you may obtain from the affidavits 290 sent in. Also one violation from Vancouver that had no inspection certificate at all and would indicate laxness in informing express employees of quarantines in force and lack of interest in outgoing shipments." (The Vancouver case mentioned is a shipment of twenty gooseberries via express by J. A. Chandler, Vancouver, Washington to Nellie Kletsch, Molalla, Oregon on April 2, 1923. There was no tag or other marking to indicate the address of the consignor. There was no inspection tag. There is a Washington state inspector located at Vancouver."

One of the other cases was a shipment of 12 gooseberries from the Home Nursery Co., Richland, Washington, via express to Mrs. J. F. Schooley, Box 93, Scappose, Oregon. In the case of this shipment there was a state inspector's tag bearing the written signature of the inspector and dated as signed by him on the day the shipment was made.

The other case mentioned is the shipment of two gooseberries and two white pine by N. K. Lathrop, Manchester, Washington via Parcel Post to Mrs. Etta Shahan, Portland, Oregon. This shipment bore the state of Washington inspection tag dated the same day the shipment was made and signed in the hand of the inspector at Seattle."

Seattle: "Inspectors at Seattle interpreted state quarantine #12 as permitting movement of all red currants and gooseberries within the state whether they came from licensed nurseries or not. They were stopping shipments of all black currants and white pines. After a conference with them, they stopped all shipments within the state not coming from licensed nurserymen.

Inspector at Sumner stated they had never received copies of state quarantines 12 and 13. I sent them such copies."

Tacoma: "Mr. Huff, State Inspector, is evidently not very familiar with the state quarantines on blister rust hosts but caught and held one shipment of Ribes nigrum in violation thereof. I have explained the federal regulations to him but do not believe he remembers them."

Question No. 2

Do the state inspectors know the federal blister rust regulations? Are they enforcing them?

Ogden: "I believe they know the federal regulations and are enforcing them."

Spokane: "I believe that they know federal quarantine 54, but I am very doubtful if they could give any other. Except for one slip the last day of my work at Spokane, I believe that L. M. Pinkerton, the deputy at that point was making at least an effort to watch for the federal quarantines." (Early in the season I found that they did not know the federal quarantine 54 at all until I explained the regulation to them. They did not know that such a quarantine had ever been passed but finally succeeded in finding a copy in their files. In fact the local inspectors were hesitating about carrying on any inspection on incoming stuff besides outgoing shipments.)

Pasco: No information.

Portland: Information under question 1 indicated that they neither knew the federal regulation nor were they enforcing it.

Seattle: "I believe the inspectors at Seattle and Sumner are familiar with federal quarantine 26, and 54 in so far as it prohibits shipments from west of the Cascades. When formal notice of the extension of 54 was received in the spring, they were informed that 54 covered the whole state. No case of lack of enforcement has come to my attention." In answer to question 3 he states that one federal and one state violation was passed by the local inspector.

Tacoma: "I have explained the federal regulations to him but do not believe that he remembers them. He has apparently met with no federal violations."

Question No. 3.

Have they made any exception in the case of state violations called to their attention?

Ogden: No information.

Spokane: "They made oneexception of a state violation which I called to their attention, namely from Western Washington Experiment Station Puyallup, Washington to A. W. Davis 412 Ziegler Bldg., Spokane, Wash. The state department at Olympia allowed the delivery of this shipment."

Pasco: No information.

Portland:" "

Seattle: " "

Tacoma: "Have heard that an officer of an Everett bank was allowed to retain his black currants in that city but no other exceptions have come to my notice."

Question No. 4.

Have you had any cases where a shipment containing a violation either state or federal had been passed by a state inspector?

Ogden: No cases.

Spokane: "My last day, while instructing W. J. Bach in the work, I caught a shipment from the Kelly Gardens, Spokane, Washington going to Ben Harman, Joseph, Oregon containing three red currants and nothing else which had been passed and tagged by L. M. Pinkerton on the previous day (April 22.) I called him up and he (Pinkerton) stated that he had given those tags yesterday for shipping strawberries, and that they had not been on the bundle at the time he signed them."

Pasco: No cases.

Portland: See cases under question 1.

Seattle: "Yes. One state violation and one federal violation. About March 8, 1923, parcel post package not carrying an inspection tag containing red currants or gooseberries was passed by the deputy state inspector at Seattle, because he was not aware that quarantine 12 prohibited shipments of red currants or gooseberries. I had state authority, and held up shipment and sent it back without the knowledge of the deputy state inspector.

On March 29, 1924, I intercepted a parcel post package consigned by K. C. Belfaed, 302 Cherry St., Port Angeles, Washington to Mrs. J. L. Rupe, Brunelda, Montana. Package contained approximately 4 red currant cuttings, 1 loganberry and 1 blackberry. Package carried berries, and signed by inspector S. Land, Port Angeles, Washington. Package was returned to sender, and on April 2, 1923, a letter was received from P. M. at Port Angeles, Washington to Supt. of mails, Seattle, Washington that read as follows:

Port Angeles, Wash.
March 30, 1923.

Postmaster,
Seattle, Wash.

Superintendent of Mails:

My Dear Sir:

Returned for your attention one parcel post package containing blackberry plants mailed at this office by K. C. Belford, 302 Cherry St., addressed for delivery to Mrs. J. L. Rupe, Brunelda, Montana.

These plants were inspected by the Horticultural Inspector and his inspection certificate is and was attached at the time of mailing.

The parcel was however returned from your office marked "Unmailable."

Inasmuch as these plants "blackberries" do not appear in the list of plants quarantines as per department order dated March 14, 1923, and the local inspector states that they have been returned in error, I wish you would take the matter up with the inspector at your terminal station so that there may be a clear understanding.

Sincerely yours,
A.J.Cosser, P. M.
by T. S. Dickinson, Asst.

"P.O.Clerk, Warmack called me regarding the same package resent on its way. Together we reopened package, and it contained 4 red currant cuttings labeled "currants"."

Consequently the following letter was sent by Supt. Terminal Station, Seattle, and the package was also returned the second time to the consignor."

Seattle, Wash.
April 2, 1923

Postmaster
Port Angeles, Wash.

My dear Sir:

The accompanying parcel containing plants was rejected by H. N. Putnam, Federal Horticultural Inspector, on March 29, 1923, as it contained 4 red or white currant cuttings shipped in violation of federal quarantine No. 54, which prohibits the movement of currants gooseberries or white pine from the State of Washington, and as the same four cuttings are in the parcel at this time, I am returning it again. The blackberries however are mailable.

Respectfully,
C. M. Perkins, P. M.
by D. Rogay
Supt. Terminal Station.

"Nothing more has been heard of the matter."

Tacoma: No cases.

Question No. 5.

Have you had any difficulty in securing the cooperation of any agencies with whom you are in contact? Give the specific reason for your trouble or your opinion of the cause of the trouble.

Ogden: "I received the best of cooperation from all agencies."

Spokane: "No agency or company has failed to give good cooperation in permitting or aiding our inspection, altho certain individual employees of companies have failed to live up to that spirit of cooperation. I believe that this is due largely to the general contrariness of certain individuals, and in the instance of one mail clerk whom I encountered, it is the result of overbearing attitude of a previous inspector. After several weeks of "constantly warmer weather," he thawed out enough to tell me why he had been so grouchy toward me."

Pasco: "Have not had the slightest bit of trouble with any agency. Have found all parties willing to cooperate readily. Have had no trouble in securing permission to enter any express car when necessary

to expedite inspection work. Have never asked permission to enter mail cars as their quarters were so cramped and the messengers were always very busy while at this station. I have always made it a rule to assist the men handling express when I could do so without interfering with my work. This has helped to gain their good will."

Portland: "I have had no trouble in securing all cooperation desired here of express, Parcel Post or freight men. The state horticultural office has also been very good."

Seattle: "No difficulty in securing any cooperation with different agencies."

Tacoma: "On beginning work here I noticed that there were no shipments from Tacoma or vicinity being held for inspection except by the American Express Co., in investigating at the P. O. & R. R. freight depots was informed that they did not understand that we wished to inspect outgoing shipments. Some P. O. employees were apparently not in favor of holding outgoing shipments but this was gradually overcome by explaining our work showing them some infected cane berries found in the mail (infected with cane gall) and trying to create a friendly relation by showing a desire to avoid delaying the mails or inconveniencing them in their work. Apparently the weak point in federal inspection here is in returning shipments as they may be reshipped in concealed packages or by another route. I would earnestly recommend that all inspectors be at least allowed to remove all foliage from intercepted Ribes as a precautionary measure." Mr. Huff (local inspector) has cooperated very heartily with me here even going to extremes in offering to destroy instead of returning state violations. This has been apparently because we have taken over his work at this inspection point and partly because of personal friendship."

Question No. 6.

Do you consider that the federal and state blister rust quarantines would be efficiently enforced by the state inspectors, if no federal inspector was at that point?

Ogden: "The other work required of state and county inspectors does not allow them the proper time to carefully and satisfactorily inspect all nursery shipments which are of special interest to the blister rust office. Material consigned to a county seat where the county inspector is usually located probably received thorough inspection. This was especially true in Ogden.

Utah at present time has no inspectors for all counties nor an adequate force to take care of the terminal inspection of Parcel Post. A reorganization of the inspection department of the state is now in progress whereby more capable men will assume duties as inspectors and the entire state adequately covered. Even with this system established a federal inspector would still be needed."

Spokane: "There would be very little, if any, blister rust quarantine enforcement if no federal inspector was present."

Pasco: "Judging from experience I would say that it would be as well to look to the state inspectors for enforcement of federal and state blister quarantines at this point. Some arrangement could probably be made with the state inspectors who inspect shipments of nursery stock at time of shipping giving them authority to enforce federal regulations if necessary in addition to their state duties."

Portland: "I do not believe this point could be effectively handled by state officials only, since their other duties keep them from keeping the regular schedule necessary for effective protection."

Seattle: "I do not believe state inspectors would effectively inspect shipments without federal help."

Tacoma: "He (the local inspector) is an old style politician and lazy so I have no hopes of his efficiently enforcing either state of federal blister rust quarantines when no federal inspector is stationed here. As an example, I found on beginning work here that he deputized an untrained lady clerk in the state grain inspectors' office to certify for him any mail shipments brought to her. She stated that she didn't open packages but merely inquired as to whether there were any berry bushes of certain varieties enclosed. If she was told there were none she attached a certificate. In order to protect our interest I changed this plan so that they were left at P. O. for my inspection and attached state certificate as deputy for Mr. Huff if they were mailable. This helped us with the employees of the P. O. as it saved delay and they had been informed by shippers that the lady did not even open their packages for inspection. Mr. Huff has never been in favor of eradicating black currants and is inclined to avoid any disagreeable quarantine enforcement when convenient."

Summary of Quarantine.

1. In the two years of quarantine inspection in the West 533 violations of blister rust quarantines have been recorded. (This figure includes spring 1922 quarantine work in middle west.) 371 of these were violations of the State of Washington quarantine; 131 were violations of quarantine No. 26; 45 were violations of quarantine No. 54; 6 were violations of quarantine No. 37.

2. 34 were shipments of white pine while 499 were Ribes.

3. 71% were by nurserymen and 29% by individuals.

4. The number of violations by nurserymen at the end of the second year approached the zero point, all violations in fall 1923 being by individuals.

5. Violations by individuals during this period have decreased about 50%.

6. During this two year period there has been a considerable decrease in the number of Ribes shipments but no appreciable decrease in the number of pine shipments.

7. Parcel Post is the most serious offender. Two seasons experience has shown that 61% of the plant shipments are made by Parcel Post. 53% of the violations in 1922 were by Parcel Post, while 72% were by Parcel Post during 1923.

8. Of the 57 violations intercepted during 1923, 46 were without an inspection tag.

9. Of the 43 Ribes violations of the 1923 season 24 consisting of 200 plants bore leaves.

10. There is need for definite educational work among the nurserymen, state inspectors and transporting agencies each at least once each year just before the spring shipping season.

F I N A N C I A L R E P O R T

April 1 to December 31, 1923.

STATEMENT I, GENERAL DISTRIBUTION OF FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1923 (Blister Rus Control)"

	PURPOSE							STATE TO WHICH CHARGED						PROJECT TO WHICH CHARGED					
	Salary	Expenses	Transp. Requests	Personal Autos	Hired Auto Operation	Miscella-eous	Total	Idaho	Montana	Oregon	Washington	Inter-state	Total	I	II	III	IV	V	Total
Alexander, Constance	$ 300.00	$ 27.75	$ 13.64				$ 341.39					$ 341.39	$ 341.3					$ 341.39	$ 341.39
Bach, Walter J.	375.00	313.19	7.24	$ 178.01			873.44				$ 494.13	379.31	873.4		$ 494.13		$ 379.31		873.44
Bartow, H. G.	450.00	290.75	10.30	104.86			855.91				335.73	520.18	855.9	$ 257.25	335.73		262.93		855.91
Bean, Charles F.	177.00	198.09					375.09			$ 375.09			375.(		375.09				375.09
Beeson, Harold L.	173.33	180.25			$ 67.47		421.05		$ 421.05				421.(		421.05				421.05
Calhoun, Roy	450.00	12.75	11.39				474.14					474.14	474.1					474.14	474.14
Churchill, J. A.	.25						.25			.25			.2		.25				.25
de Macedo, Wm.	200.00	216.01	15.00				431.01			431.01			431.		431.01				431.01
Epling, C. C.	110.00	10.25	18.99				139.24					139.24	139.	139.24					139.24
Glindeman, H. L.	153.33	113.84			38.64		305.81	$ 305.81					305.		305.81				305.81
Goodding, L. N.	500.00	151.68	104.55	32.83			789.06			789.06			789.		789.06				789.06
Green, A. W.	80.00						80.00					80.00	80.					80.00	80.00
Hatton, C. H.	223.33	59.90	42.63				325.86					325.86	325.	325.86					325.86
Hayhurst, L. W.	173.33	155.25					328.58		328.58				328.		328.58				328.58
Johnson, C. H.	500.00	210.84	77.77				788.61		513.87			274.74	788.		513.87		274.74		788.61
Kee, Walter H.	196.67	181.15	27.85				405.67					405.67	405.	405.67					405.67
Kuhns, Buford E.	138.00	119.50					257.50	257.50					257.		257.50				257.50
Lackey, Charles F.	200.00	180.60					380.60				380.60		380.		380.60				380.60
Lungreen, Rolfe P.	223.33	166.76	30.98				421.07					421.07	421.	421.07					421.07
Mallery, T. D.	180.00	198.84	18.74				397.58			397.58			397.		397.58				397.58
Montgomery, R. E.	83.33						83.33	83.33					83.		83.33				83.33
Parkins, A. L.	153.33	128.95			53.19		335.47	335.47					335.		335.47				335.47
Patrie, C. R.	375.00	262.70	55.55				693.25					693.25	693.	493.74			199.51		693.25
Peterson, C. O.	223.33	63.65	42.63				329.61					329.61	329.	329.61					329.61
Putnam, H. N.	555.00	262.84	4.25	5.74			827.83					827.83	827.	669.17			158.66		827.83
Rockie, W. A.	510.00	298.50	78.10	19.88			906.48					906.48	906.	667.25			239.23		906.48
Root, G. A.	450.00	190.16	54.39				694.55					694.55	694.	251.91			442.64		694.55
Ryan, C. C.	153.33	100.00					253.33	253.33					253.		253.33				253.33
Schmitz, H.	120.00	104.44	150.00				374.44	374.44					374.		374.44				374.44
Severns, E. J.	200.00	207.75		240.17			647.92		647.92				647.		647.92				647.92
Shinn, Wm. R.	450.00	273.40		245.35			968.75				734.75	234.00	968.		734.75		234.00		968.75
Shovell, W. L.	62.50						62.50		62.50				62.		62.50				62.50
Simcoe, P. S.	210.00	194.85	15.89		82.73		503.47				503.47		503.		503.47				503.47
Snow, E. A.	168.67	133.21			57.09		358.97	358.97					358.		358.97				358.97
Spiegelberg, C. H.	200.00	179.25					379.25				379.25		379.		379.25				379.25
Sprague, Roderick	200.00	179.25					379.25				379.25		379.		379.25				379.25
Stephenson, W. L.	180.00	215.09		102.42			497.51			497.51			497.		497.51				497.51
Stillinger, C. R.	750.00	231.84	189.65				1,171.49					1,171.49	1,171.49		847.91		323.58		1,171.49
Stone, W. S.	153.33	90.90					244.23	244.23					244.		244.23				244.23
Trower, Olive	100.00						100.00					100.00	100.					100.00	100.00
Van Laanen, Lillian	14.00						14.00					14.00	14.					14.00	14.00
Wyckoff, S. N.	750.00	162.08	274.67			$ 41.75	1,228.50					1,228.50	1,228.50			$1,228.50			1,228.50
Young, R. O.	200.00	182.25					382.25		382.25				382.		382.25				382.25
Laborers, Priest River, Ida.	1,595.90	857.78	88.70			168.92	2,711.30					2,711.30	2,711.30	2,711.30					2,711.30
Laborers, Cheekye, B. C.	2,113.66	1,809.21	6.00			112.38	4,041.25					4,041.25	4,041.25	4,041.25					4,041.25
Autos, hired						623.53	623.53	300.96	125.81		196.76		623.		623.53				623.53
Botany Dept., O. A. C.						83.46	83.46			83.46			83.		83.46				83.46
Elk River Project						65.65	65.65					65.65	65.65	65.65					65.65
Collaborator's Salaries																			
A.O.Garrett & B.O.Longyear	.50						.50					.50	.50		.50				.50
Miscellaneous Field Supplies						100.25	100.25					100.25	100.25	100.25					100.25
Miscellaneous Office Supplies						190.73	190.73					190.73	190.73					190.73	190.73
Telephone and Telegraph						110.97	110.97					110.97	110.97					110.97	110.97
Office Rent						298.13	298.13					298.13	298.13					298.13	298.13
Total	$14,775.45	$8,915.50	$1,338.91	$ 929.26	$ 299.12	$1,795.77	$28,054.01	$2,514.04	$2,481.98	$2,573.96	$3,403.94	$17,080.09	$28,054.01	$10,879.22	$11,822.33	$1,228.50	$2,514.60	$1,609.36	$28,054.01

STATEMENT II, DISTRIBUTION OF FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1923, (Blister Rust Control)" ACCORDING TO STATES, SUSPENSE AND PROJECTS

ITEMS DIRECTLY CHARGEABLE TO STATES

PROJECT II.

	Salaries	Expenses	Trans. Requests	Hired Autos	Hired Auto Operation	Personal Autos	Miscellaneous	Total
IDAHO								
Cultivated Black Currant Eradication:								
Temporary men	$ 1,003.32	$ 686.40	$	$300.96	$ 148.92			$ 2,139.60
H. Schmitz	120.00	104.44	150.00					374.44
Total for State	$ 1,123.32	$ 790.84	$ 150.00	$300.96	$ 148.92			$ 2,514.04
MONTANA								
Cultivated Black Currant Eradication:								
Temporary men	$ 746.66	$ 725.50		$125.81	$ 67.47	$ 240.17		$ 1,905.61
C. H. Johnson & W. L. Shovell	395.84	102.76	$ 77.77					576.37
Total for State	$ 1,142.50	$ 828.26	$ 77.77	$125.81	$ 67.47	$ 240.17		$ 2,481.98
OREGON								
Cultivated Black Currant Eradication:								
Temporary men	$ 737.25	$ 828.03	$ 33.74			$ 102.42		$ 1,701.44
School campaign expenses							$ 83.46	83.46
L. N. Goodding	500.00	151.68	104.55			32.83		789.06
Total for State	$ 1,237.25	$ 979.71	$ 138.29			$ 135.25	$ 83.46	$ 2,573.96
WASHINGTON								
Cultivated Black Currant Eradication:								
Temporary men	$ 1,276.67	$ 1,072.80	$ 15.89	$196.76	$ 82.73	$ 423.36		$ 3,068.21
H. G. Bartow (Scouting)	150.00	92.25	4.30			89.18		335.73
Total for State	$ 1,426.67	$ 1,165.05	$ 20.19	$196.76	$ 82.73	$ 512.54		$ 3,403.94

ITEMS NOT DIRECTLY CHARGEABLE TO STATES

PROJECT I.								
Priest River, Idaho	$ 2,375.08	$ 954.64	$ 138.98				$ 168.92	$ 3,637.62
Cheekye, B. C.	3,464.64	2,822.88	214.73				112.38	6,614.63
Checking Elk River, Idaho	190.83	113.55	48.10					352.48
Completion Elk River, Idaho							65.65	65.65
Forest Service (R.P.Lungreen)	66.67	25.96	17.86					110.49
Miscellaneous supplies							100.25	100.25
Total for Project	$ 6,097.22	$ 3,917.03	$ 419.67				$ 447.20	$10,881.12
PROJECT II.								
Educational (C.R.Stillinger)	$ 500.00	$ 164.16	$ 183.75					$ 847.91
Collaborators (Garrett & Longyear)	.50							.50
Total for Project	$ 500.50	$ 164.16	$ 183.75					$ 848.41
PROJECT III.								
Supervision (S.N.Wyckoff)	$ 750.00	$ 162.08	$ 274.67				$ 41.75	$ 1,228.50
Total for Project	$ 750.00	$ 162.08	$ 274.67				$ 41.75	$ 1,228.50
PROJECT IV.								
Quarantine	$ 1,553.99	$ 867.87	$ 49.54			$ 41.30		$ 2,512.70
Total for Project	$ 1,553.99	$ 867.87	$ 49.54			$ 41.30		$ 2,512.70
PROJECT V.								
Office Clerical	$ 944.00	$ 40.50	$ 25.03					$ 1,009.53
Supplies							$ 190.73	190.73
Telephone & Telegraph							$ 110.97	110.97
Rent, office							298.13	298.13
Total for Project	$ 944.00	$ 40.50	$ 25.03				$ 599.83	$ 1,609.36
GRAND TOTALS	$ 14,775.45	$ 8,915.50	$1,338.91	$ 623.53	$ 299.12	$ 929.26	$1,172.24	$28,054.01

STATEMENT III.

DISTRIBUTION OF FUNDS, "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1923 (Blister Rust Control)" ACCORDING TO STATES.

IDAHO.	
Directly Chargeable to Idaho	$2,514.04
Project I, " " " (Local Control)	4,055.75
Project I, " " " (Control Reconnaissance)	110.49
Project I, " " " (Experimental Eradication)	1,538.33
Project II, " " "	194.36
Project III, " " "	281.44
Project IV, " " "	575.64
Project V, " " "	368.69
	$9,638.74
MONTANA.	
Directly Chargeable to Montana	$2,481.98
Project I, " " " (Experimental Eradication)	1,518.71
Project II, " " "	191.89
Project III, " " "	277.85
Project IV, " " "	568.30
Project V, " " "	363.99
	$5,402.72
OREGON.	
Directly Chargeable to Oregon	$2,573.96
Project I, " " " (Experimental Erad)	1,574.99
Project II, " " "	199.00
Project III, " " "	288.15
Project IV, " " "	589.36
Project V, " " "	377.48
	$5,602.94
WASHINGTON.	
Directly Chargeable to Washington	$3,403.94
Project I, " " " (Experimental Eradication)	2,082.85
Project II, " " "	263.16
Project III, " " "	381.06
Project IV, " " "	779.40
Project V, " " "	499.20
	$7,409.61
GRAND TOTAL	$28,054.01

NOTE: Percentage of "Items Not Directly Chargeable to States" charged to above states as follows (excluding local control and control reconnaissance):

Idaho - 22.9092.
Montana . 22.6171.
Oregon - 23.4552.
Washington - 31.0185.

STATEMENT IV,
RECONCILIATION OF STATEMENTS I, II and III WITH TOTAL EXPENDITURES FROM FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1923 (Blister Rust Control)".

Checks drawn by Calhoun on above funds.	$26,616.60
Retirement deduction applicable to above checks	137.86
Total Charge to Above Funds	$26,754.46
Total as per statements I, II and III.	$28,054.01
Less transportation requests included in statements* .	1,299.55
Total Charge to Above Funds. . . .	$26,754.46

*Total transportation requests as per statements

I, II and III	$1,338.91
Cash transportation items included	39.36
Transportation Requests	$1,299.55

STATEMENT I, GENERAL DISTRIBUTION OF FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1923 (Blister Rust Control)" 7/1/23 - 12/31/23.

	PURPOSE							STATE TO WHICH CHARGED							PROJECT TO WHICH CHARGED						
	Salary	Expenses	Transp. Requests	Personal Autos	Hired Auto Operation	Miscellaneous	Total	California	Idaho	Montana	Oregon	Washington	Interstate	Total	I	II	III	IV	V	VI	Total
Alexander, Constance	$ 600.00						$ 600.00						$ 600.00	$ 600.00					$ 600.00		$ 600.00
Bach, Walter J.	437.50	$ 344.10		$ 533.26			1,314.86		$ 129.91			$ 1,184.95		1,314.86		$ 1,314.86					1,314.86
Bean, Charles F.	135.00	164.41	$ 15.00				314.41				$ 314.41			314.41		314.41					314.41
Beeson, Harold L.	150.00	118.50	12.96		$ 78.46		359.92			$ 359.92				359.92		359.92					359.92
Calhoun, Roy	1,020.00	9.45	6.38				1,035.83						1,035.83	1,035.83					1,035.83		1,035.83
deMacedo, William	150.00	191.15	15.00				356.15				356.15			356.15		356.15					356.15
Epling, Carl C.	233.33	33.25	19.89				286.47						286.47	286.47			$ 286.47				286.47
Glindeman, Herbert L.	200.00	188.60			75.38		463.98		463.98					463.98		463.98					463.98
Goodding, Leslie N.	1,000.00	226.62	8.25	182.91			1,417.78				1,417.78			1,417.78		1,417.78					1,417.78
Hayhurst, Lewis W.	150.00	126.75					276.75			276.75				276.75		276.75					276.75
Johnson, Charles H.	1,000.00	266.24	45.53		59.76		1,371.53			1,090.45			281.08	1,371.53		1,090.45		$ 281.08			1,371.53
Kee, Walter H.	250.00	27.85	5.70				283.55						283.55	283.55			283.55				283.55
Klatt, Mrs. Lillian E.	36.67						36.67						36.67	36.67					36.67		36.67
Kuhns, Buford E.	177.00	162.89					339.89		339.89					339.89		339.89					339.89
Lackey, Charles F.	220.00	189.00	8.96				417.96					107.67	310.29	417.96		107.67	310.29				417.96
Lungreen, Rolfe P.	300.00	13.30	15.89				329.19						329.19	329.19			329.19				329.19
Mallery, Thomas D.	135.00	162.60	31.12				328.72				328.72			328.72		328.72					328.72
Montgomery, Ruth E.	100.00						100.00		100.00					100.00		100.00					100.00
McLeod, R. L.	348.00						348.00						348.00	348.00	$ 348.00						348.00
Parkins, Arlie L.	193.33	187.76			103.76		484.85		484.85					484.85		484.85					484.85
Patrie, Carthon R.	750.00	285.07	26.09				1,061.16					154.78	906.38	1,061.16		154.78	432.84	473.54			1,061.16
Paul, Leonard	20.00						20.00						20.00	20.00			20.00				20.00
Pennington, Leigh H.	600.00	286.52	72.93				959.45						959.45	959.45	959.45						959.45
Putnam, Henry N.	1,110.00	197.39		164.92			1,472.31					346.03	1,126.28	1,472.31	181.85	346.03	944.43				1,472.31
Rockie, William A.	1,200.00	330.70		85.26			1,615.96		361.76				1,254.20	1,615.96		361.76	1,254.20				1,615.96
Root, George A.	900.00	376.63	48.79				1,325.42					711.29	614.13	1,325.42		861.29		464.13			1,325.42
Ryan, Cecil C.	193.33	182.85					376.18		376.18					376.18		376.18					376.18
Schmitz, Henry	112.50	57.15					169.65		169.65					169.65		169.65					169.65
Severns, Erma J.	150.00	137.25		222.32			509.57				509.57			509.57		509.57					509.57
Shinn, William R.	230.00	117.44					347.44						347.44	347.44				347.44			347.44
Shovell, W. L.	150.00						150.00				150.00			150.00		150.00					150.00
Simcoe, Philip S.	313.33	101.61	32.35	150.08			597.37					328.53	268.84	597.37		328.53	248.13	20.71			597.37
Snow, Elva A.	216.33	162.07			70.81		449.21		449.21					449.21		449.21					449.21
Spiegelberg, Carl H.	140.00	115.23					255.23					255.23		255.23		255.23					255.23
Sprague, Roderick	150.00	115.50			57.10		322.60					322.60		322.60		322.60					322.60
Stephenson, W. L.	135.00	161.81	15.00				311.81				311.81			311.81		311.81					311.81
Stillinger, Charles R.	1,400.00	245.06	63.00				1,808.06						1,808.06	1,808.06		1,308.06		500.00			1,808.06
Stone, William S.	200.00	188.30					388.30		388.30					388.30		388.30					388.30
Wyckoff, Stephen N.	1,400.00	125.90	307.35				1,933.25						1,933.25	1,933.25						$1,933.25	1,933.25
Young, Robert O.	156.67	137.25					293.92			293.92				293.92		293.92					293.92
Hired Autos						$ 834.04	834.04		407.42	278.23		148.39		834.04		834.04					834.04
"92" Supplies, etc.	63.35					21.21	84.56				84.56			84.56		84.56					84.56
Reconnaissance Supplies, etc.		97.33				268.42	365.75						365.75	365.75			365.75				365.75
Miscellaneous Office Supplies						264.82	264.82						264.82	264.82					264.82		264.82
Telephone & Telegraph						100.99	100.99						100.99	100.99					100.99		100.99
Office Rent						342.00	342.00						342.00	342.00					342.00		342.00
Freight, Express & Requisi'ns						239.07	239.07	$33.03	.52		27.95	2.56	175.01	239.07		74.67	37.11		127.29		239.07
TOTALS	$16,626.34	$5,833.53	$ 750.19	$1,338.75	$ 445.27	$2,070.55	$27,064.63	$33.03	$3,671.67	$2,958.84	$2,841.38	$ 3,562.03	$13,997.68	$27,064.63	$1,489.30	$14,535.62	$4,511.96	$2,086.90	$2,507.60	$1,933.25	$27,064.63

STATEMENT II, DISTRIBUTION OF FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1924, (Blister Rust Control)" ACCORDING TO STATES, SUSPENSE AND PROJECTS, 7/1/23 - 12/31/23

ITEMS DIRECTLY CHARGEABLE TO STATES

PROJECT II.

	Salaries	Expenses	Trans. Requests	Hired Autos	Hired Auto Operation	Personal Autos	Miscellaneous	Total
CALIFORNIA								
Express							$ 33.03	$ 33.03
Total for State							$ 33.03	$ 33.03
IDAHO								
Cultivated Black Currant Eradication	$ 1,179.99	$ 1,072.47	$	$	$	$	$	$
Temporary men	1,179.99	1,072.47		407.42	249.95			2,909.83
H. Schmitz	112.50	57.15						169.65
Stenographer	100.00							100.00
Scouting for disease (Rockie & Bech)	262.50	103.10				126.07	.52	491.67
Express							.52	.52
Total for State	$ 1,654.99	$ 1,232.72		$407.42	$ 249.95	$ 126.07	$ .52	$ 3,671.67
MONTANA								
Cultivated Black Currant Eradication								
Temporary men	$ 606.67	$ 519.75	$ 12.96	$225.00	$ 78.46	$ 222.32		$ 1,665.16
C. H. Johnson & W. L. Shovell	816.67	114.67	24.64		30.65			986.63
Scouting for disease (Johnson)	166.66	58.05		53.23	29.11			307.05
Total for State	$ 1,590.00	$ 692.47	$ 37.60	$ 278.23	$ 138.22	$ 222.32		$ 2,958.84
OREGON								
Cultivated Black Currant Eradication								
Temporary men	$ 555.00	$ 679.97	$ 76.12					$ 1,311.09
L. N. Goodding	333.33	118.57	8.25			$ 112.49	$	572.64
School Campaign	313.35	46.23				9.77	21.21	390.56
Nursery Inspection	166.67	33.17				50.89		250.73
Scouting for disease	250.00	28.65				9.76		288.41
Express							27.95	27.95
Total for State	$ 1,618.35	$ 906.59	$ 84.37			$ 182.91	$ 49.16	$ 2,841.38
WASHINGTON								
Cultivated Black Currant Eradication								
Temporary men	$ 360.00	$ 301.02	$	$148.39	$ 57.10			$ 866.51
G. A. Root & W. J. Bach	412.50	156.15				$ 166.74		735.39
Nursery Inspection	125.00	80.10	11.30					216.40
Scouting for disease (Root, Bach, Patrie, Putnam, Simcoe)	660.83	496.17	14.65			569.52		1,741.17
Express							$ 2.56	2.56
Total for State	$ 1,558.33	$ 1,033.44	$ 25.95	$148.39	$ 57.10	$ 736.26	$ 2.56	$ 3,562.03

ITEMS NOT DIRECTLY CHARGEABLE TO STATES

PROJECT 1.

L. H. Pennington	$ 600.00	$ 286.52	$ 72.93					$ 959.45
H. N. Putnam	92.50	65.62				$ 23.73		181.85
R. L. McLeod	348.00							348.00
Total for Project	$ 1,040.50	$ 352.14	$ 72.93			$ 23.73		$ 1,489.30
PROJECT II.								
C. R. Stillinger	$ 1,000.00	$ 245.06	$ 63.00					$ 1,308.06
G. A. Root	150.00							150.00
Express							$ 10.61	10.61
Total for "II"-"99"	$ 1,150.00	$ 245.06	$ 63.00				$ 10.61	$ 1,468.67
PROJECT III.								
Control Reconnaissance *	$ 3,410.83	$ 684.34	$ 63.80			$ 47.46	$	$ 4,206.43
Miscellaneous Expenses							268.42	268.42
Express							37.11	37.11
Total for Project	$ 3,410.83	$ 684.34	$ 63.80			$ 47.46	$ 305.53	$ 4,511.96
PROJECT IV.								
Quarantine	$ 1,446.67	$ 551.42	$ 88.81					$ 2,086.90
Total for Project	$ 1,446.67	$ 551.42	$ 88.81					$ 2,086.90
PROJECT V.								
Miscellaneous	$ 1,656.67	$ 9.45	$ 6.38					$ 1,672.50
Miscellaneous Office Expenses							$ 264.82	264.82
Telephone and Telegraph							100.99	100.99
Office Rent							342.00	342.00
Express							127.29	127.29
Total for Project	$ 1,656.67	$ 9.45	$ 6.38				$ 835.10	$ 2,507.60
PROJECT VI.								
Supervision (S.N.Wyckoff)	$ 1,500.00	$ 125.90	$ 307.35					$ 1,933.25
Total for Project	$ 1,500.00	$ 125.90	$ 307.35					$ 1,933.25
GRAND TOTALS	$16,626.34	$ 5,833.53	$ 750.19	$834.04	$ 445.27	$1,338.75	$1,236.51	$ 27,064.63

PROJECT III.*

Control Reconnaissance consists of Scouting Priest River Experiment Station subsequent to 7/1/23	$ 444.17	$ 78.43	$ 9.50					$ 532.10
Control Reconnaissance Upper Priest River, Ida. & N.E. Washington	2,966.66	605.91	54.30			$ 47.46	$	3,674.33
Total	$ 3,410.83	$ 684.34	$ 63.80			$ 47.46		$ 4,206.43

STATEMENT III

DISTRIBUTION OF FUNDS, "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY, 1924 (Blister Rust Control)" ACCORDING TO STATES, 7/1/23 - 12/31/23

CALIFORNIA	
Directly Chargeable to California	$33.03
Project I " " "	3.76
Project II " " "	3.71
Project IV " " "	5.28
Project V " " "	6.34
Project VI " " "	4.89
	$57.01
IDAHO	
Directly Chargeable to Idaho	$3,671.67
Project I " " "	418.48
Project II " " "	412.68
Project III " " "	2,522.03
Project IV " " "	586.40
Project V " " "	704.61
Project VI " " "	543.22
	$8,859.09
MONTANA	
Directly Chargeable to Montana	$2,958.84
Project I " " "	337.23
Project II " " "	332.56
Project IV " " "	472.55
Project V " " "	567.81
Project VI " " "	437.76
	$5,106.75
OREGON	
Directly Chargeable to Oregon	$2,841.38
Project I " " "	323.85
Project II " " "	319.36
Project IV " " "	453.79
Project V " " "	545.27
Project VI " " "	420.38
	$4,904.03
WASHINGTON	
Directly Chargeable to Washington	$3,562.03
Project I " " "	405.98
Project II " " "	400.36
Project III " " "	1,989.93
Project IV " " "	568.88
Project V " " "	683.57
Project VI " " "	527.00
	$8,137.75
GRAND TOTAL	$27,064.63

NOTE: Percentages of "Projects I, II, IV, V and VI" charged to above states as follows: California - 0.2528; Idaho - 28.0989; Montana - 22.6437; Oregon - 21.7448; and Washington - 27.2598.

STATEMENT IV.

RECONCILIATION OF STATEMENTS I, II and III WITH TOTAL EXPENDITURES FROM FUNDS "GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY. 1924 (Blister Rust Control)" 7/1/23 - 12/31/23.

Checks drawn by Calhoun on above funds.	$25,799.93
Retirement deduction applicable to above checks	275.44
Freight, Express and Requisitions	239.07
Total Checks, Freight, Express & Requisitions. ..	$26,314.44
Total as per Statements I, II and III	$27,064.63
Less transportation requests included in statements	750.19
Total Checks, Freight, Express & Requisitions. ..	$26,314.44